MEGA-MIG® 300 RVS
Constant Voltage Type
Rectifier Welding Machine
Model RC-300-RVS

For the Following Specs:
- 6310-1
- 6311-1
- 6311A-1
- 6312-1
- 6312A-1
- 6313-1
- 6314-1

THERMAL ARC®
A THERMADYNE® Company

OWNER'S MANUAL Number **430429-205**
Revised December 1, 1997

IMPORTANT: Read these instructions before installing, operating, or servicing this system.

THERMAL ARC INC., TROY, OHIO 45373-1085, U.S.A.

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INTRODUCTION

How To Use This Manual

This Owner's Manual usually applies to just the underlined specification or part numbers listed on the cover. If none are underlined, they are all covered by this manual.

To ensure safe operation, read the entire manual, including the chapter on Safety Instructions and Warnings.

Throughout this manual, the words **WARNING**, **CAUTION**, and **NOTE** may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:

WARNING gives information regarding possible personal injury. Warnings will be enclosed in a box such as this.

CAUTION refers to possible equipment damage. Cautions will be shown in bold type.

NOTE offers helpful information concerning certain operating procedures. Notes will be shown in italics.

Equipment Identification

The unit's identification number (specification or part number), model, and serial number usually appear on a nameplate attached to the control panel. In some cases, the nameplate may be attached to the rear panel. Equipment which does not have a control panel such as gun and cable assemblies are identified only by the specification or part number printed on the shipping container. Record these numbers for future reference.

Receipt Of Equipment

When you receive the equipment, check it against the invoice to make sure it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to Thermal Arc, Order Department, 2200 Corporate Drive, Troy, Ohio 45373-1085. Include all equipment identification numbers as described above along with a full description of the parts in error.

Move the equipment to the installation site before uncrating the unit. A lifting eye on the top of the case has been provided so that the equipment may be carried or lifted with a crane or hoist. Use care to avoid damaging the equipment when using bars, hammers, etc., to uncrate the unit.

WARNING: Falling machine due to lifting eye failure may cause death or serious injury.

- Lifting device may fail when overloaded.
- This lifting device is designed to lift the power source **ONLY**. If the machine is equipped with a trailer or accessories over 100 pounds, **DO NOT LIFT** by lifting eyes.
- Avoid sudden jerks, drops, or swinging.
- Check lifting device components visually for looseness and signs of metal fatigue.
- Before changing any hardware, check grade and size of bolts, and replace with bolts of equal or higher size and grade.

Additional copies of this manual may be purchased by contacting Thermal Arc at the address given above. Include the Owner's Manual number and equipment identification numbers.

ARC WELDING SAFETY INSTRUCTIONS AND WARNINGS

⚠ WARNING

ARC WELDING can be hazardous.

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR. DO NOT LOSE THESE INSTRUCTIONS. READ OPERATING/INSTRUCTION MANUAL BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

Welding products and welding processes can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.

Safe practices have developed from past experience in the use of welding and cutting. These practices must be learned through study and training before using this equipment. Anyone not having extensive training in welding and cutting practices should not attempt to weld. Certain of the practices apply to equipment connected to power lines; other practices apply to engine driven equipment.

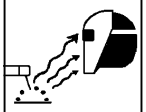
Safe practices are outlined in the American National Standard Z49.1 entitled: SAFETY IN WELDING AND CUTTING. This publication and other guides to what you should learn before operating this equipment are listed at the end of these safety precautions.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lock input power disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. Turn off all equipment when not in use. Disconnect power to equipment if it will be left unattended or out of service.
7. Use fully insulated electrode holders. Never dip holder in water to cool it or lay it down on the ground or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.
8. Do not use worn, damaged, undersized, or poorly spliced cables.
9. Do not wrap cables around your body.
10. Ground the workpiece to a good electrical (earth) ground.
11. Do not touch electrode while in contact with the work (ground) circuit.
12. Use only well-maintained equipment. Repair or replace damaged parts at once.
13. In confined spaces or damp locations, do not use a welder with AC output unless it is equipped with a voltage reducer. Use equipment with DC output.
14. Wear a safety harness to prevent falling if working above floor level.
15. Keep all panels and covers securely in place.



ARC RAYS can burn eyes and skin; NOISE can damage hearing.

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

1. Wear a welding helmet fitted with a proper shade of filter (see ANSI Z49.1 listed in Safety Standards) to protect your face and eyes when welding or watching.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.

Eye protection filter shade selector for welding or cutting (goggles or helmet), from AWS A6.2-73.

Welding or Cutting Operation	Electrode Size Metal Thickness or Welding Current	Filter Shade No.
Torch soldering	—	2
Torch brazing	—	3 or 4
Oxygen cutting		
Light	Under 1 in., 25 mm	3 or 4
Medium	1 to 6 in., 25-150 mm	4 or 5
Heavy	Over 6 in., 150 mm	5 or 6
Gas welding		
Light	Under 1/8 in., 3 mm	4 or 5
Medium	1/8 to 1/2 in., 3-12 mm	5 or 6
Heavy	Over 1/2 in., 12 mm	6 or 8
Shielded metal-arc welding (stick) electrodes	Under 5/32 in., 4 mm	10
	5/32 to 1/4 in., 4 to 6.4 mm	12
	Over 1/4 in., 6.4 mm	14

Welding or Cutting Operation	Electrode Size Metal Thickness or Welding Current	Filter Shade No.
Gas metal-arc welding (MIG)		
Non-ferrous base metal	All	11
Ferrous base metal	All	12
Gas tungsten arc welding (TIG)	All	12
Atomic hydrogen welding	All	12
Carbon arc welding	All	12
Plasma arc welding	All	12
Carbon arc air gouging		
Light		12
Heavy		14
Plasma arc cutting		
Light	Under 300 Amp	9
Medium	300 to 400 Amp	12
Heavy	Over 400 Amp	14

FUMES AND GASES can be hazardous to your health.

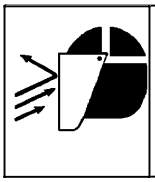
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breath the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING can cause fire or explosion.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

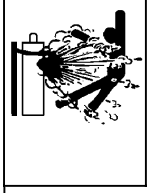
1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
11. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.



FLYING SPARKS AND HOT METAL can cause injury.

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.



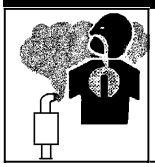
CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

⚠ WARNING

ENGINES can be hazardous.



ENGINE EXHAUST GASES can kill.

Engines produce harmful exhaust gases.

1. Use equipment outside in open, well-ventilated areas.
2. If used in a closed area, vent engine exhaust outside and away from any building air intakes.

ENGINE FUEL can cause fire or explosion.

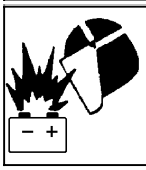
Engine fuel is highly flammable.

1. Stop engine before checking or adding fuel.
2. Do not add fuel while smoking or if unit is near any sparks or open flames.
3. Allow engine to cool before fueling. If possible, check and add fuel to cold engine before beginning job.
4. Do not overfill tank — allow room for fuel to expand.
5. Do not spill fuel. If fuel is spilled, clean up before starting engine.

MOVING PARTS can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.



SPARKS can cause BATTERY GASES TO EXPLODE; BATTERY ACID can burn eyes and skin.

Batteries contain acid and generate explosive gases.

1. Always wear a face shield when working on a battery.
2. Stop engine before disconnecting or connecting battery cables.
3. Do not allow tools to cause sparks when working on a battery.
4. Do not use welder to charge batteries or jump start vehicles.
5. Observe correct polarity (+ and –) on batteries.

STEAM AND PRESSURIZED HOT COOLANT can burn face, eyes, and skin.

The coolant in the radiator can be very hot and under pressure.

1. Do not remove radiator cap when engine is hot. Allow engine to cool.
2. Wear gloves and put a rag over cap area when removing cap.
3. Allow pressure to escape before completely removing cap.

WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Sec. 25249.5 et seq.)

NOTE: Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, Biological Effects of Power Frequency Electric & Magnetic Fields — Background Paper, OTA-BP-E-63 (Washington, DC: U.S. Government Printing Office, May 1989): "... there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around the body.
4. Keep welding power source and cables as far away from body as practical.

About Pacemakers:

The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

PRINCIPAL SAFETY STANDARDS

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices for Occupation and Educational Eye and Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

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PRECAUTIONS DE SECURITE EN SOUDAGE A L´ARC

MISE EN GARDE

LE SOUDAGE A L´ARC EST DANGEREUX

PROTEGEZ-VOUS, AINSI QUE LES AUTRES, CONTRE LES BLESSURES GRAVES POSSIBLES OU LA MORT. NE LAISSEZ PAS LES ENFANTS S'APPROCHER, NI LES PORTEURS DE STIMULATEUR CARDIAQUE (A MOINS QU'ILS N'AIENT CONSULTE UN MEDECIN). CONSERVEZ CES INSTRUCTIONS. LISEZ LE MANUEL D'OPERATION OU LES INSTRUCTIONS AVANT D'INSTALLER, UTILISER OU ENTRETENIR CET EQUIPEMENT.

Les produits et procédés de soudage peuvent sauser des blessures graves ou la mort, de même que des dommages au reste du matériel et à la propriété, si l'utilisateur n'adhère pas strictement à toutes les règles de sécurité et ne prend pas les précautions nécessaires.

En soudage et coupage, des pratiques sécuritaires se sont développées suite à l'expérience passée. Ces pratiques doivent être apprises par étude ou entraînement avant d'utiliser l'equipement. Toute personne n'ayant pas suivi un entraînement intensif en soudage et coupage ne devrait pas tenter de souder. Certaines pratiques concernent les équipements raccordés aux lignes d'alimentation alors que d'autres s'adressent aux groupes électrogènes.

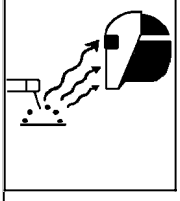
La norme Z49.1 de l'American National Standard, intitulée "SAFETY IN WELDING AND CUTTING" présente les pratiques sécuritaires à suivre. Ce document ainsi que d'autres guides que vous devriez connaître avant d'utiliser cet équipement sont présentés à la fin de ces instructions de sécurité.

SEULES DES PERSONNES QUALIFIEES DOIVENT FAIRE DES TRAVAUX D'INSTALLATION, DE REPARATION, D'ENTRETIEN ET D'ESSAI.

L'ELECTROCUTION PEUT ETRE MORTELLE.

Une décharge électrique peut tuer ou brûler gravement. L'électrode et le circuit de soudage sont sous tension dès la mise en circuit. Le circuit d'alimentation et les circuits internes de l'équipement sont aussi sous tension dès la mise en marche. En soudage automatique ou semi-automatique avec fil, ce dernier, le rouleau ou la bobine de fil, le logement des galets d'entrainement et toutes les pièces métalliques en contact avec le fil de soudage sont sous tension. Un équipement inadéquatement installé ou inadéquatement mis à la terre est dangereux.

1. Ne touchez pas à des pièces sous tension.
2. Portez des gants et des vêtements isolants, secs et non troués.
3. Isolez-vous de la pièce à souder et de la mise à la terre au moyen de tapis isolants ou autres.
4. Déconnectez la prise d'alimentation de l'équipement ou arrêtez le moteur avant de l'installer ou d'en faire l'entretien. Bloquez le commutateur en circuit ouvert ou enlevez les fusibles de l'alimentation afin d'éviter une mise en marche accidentelle.
5. Veuillez à installer cet équipement et à le mettre à la terre selon le manuel d'utilisation et les codes nationaux, provinciaux et locaux applicables.
6. Arrêtez tout équipement après usage. Coupez l'alimentation de l'équipement s'il est hors d'usage ou inutilisé.
7. N'utilisez que des porte-électrodes bien isolés. Ne jamais plonger les porte-électrodes dans l'eau pour les refroidir. Ne jamais les laisser traîner par terre ou sur les pièces à souder. Ne touchez pas aux porte-électrodes raccordés à deux sources de courant en même temps. Ne jamais toucher quelqu'un d'autre avec l'électrode ou le porte-électrode.
8. N'utilisez pas de câbles électriques usés, endommagés, mal épissés ou de section trop petite.
9. N'enroulez pas de câbles électriques autour de votre corps.
10. N'utilisez qu'une bonne prise de masse pour la mise à la terre de la pièce à souder.
11. Ne touchez pas à l'électrode lorsqu'en contact avec le circuit de soudage (terre).
12. N'utilisez que des équipements en bon état. Réparez ou remplacez aussitôt les pièces endommagées.
13. Dans des espaces confinés ou mouillés, n'utilisez pas de source de courant alternatif, à moins qu'il soit muni d'un réducteur de tension. Utilisez plutôt une source de courant continu.
14. Portez un harnais de sécurité si vous travaillez en hauteur.
15. Fermez solidement tous les panneaux et les capots.



LE RAYONNEMENT DE L´ARC PEUT BRÛLER LES YEUX ET LA PEAU; LE BRUIT PEUT ENDOMMAGER L´OUIE.

L'arc de soudage produit une chaleur et des rayons ultraviolets intenses, susceptibles de brûler les yeux et la peau. Le bruit causé par certains procédés peut endommager l'ouïe.

1. Portez une casque de soudeur avec filtre oculaire de nuance appropriée (consultez la norme ANSI Z49 indiquée ci-après) pour vous protéger le visage et les yeux lorsque vous soudez ou que vous observez l'exécution d'une soudure.
2. Portez des lunettes de sécurité approuvées. Des écrans latéraux sont recommandés.
3. Entourez l'aire de soudage de rideaux ou de cloisons pour protéger les autres des coups d'arc ou de l'éblouissement; avertissez les observateurs de ne pas regarder l'arc.
4. Portez des vêtements en matériaux ignifuges et durables (laine et cuir) et des chaussures de sécurité.
5. Portez un casque antibruit ou des bouchons d'oreille approuvés lorsque le niveau de bruit est élevé.

SELECTION DES NUANCES DE FILTRES OCULAIRES POUR LA PROTECTION DES YEUX EN COUPAGE ET SOUDAGE
(selon AWS A 8.2-73)

Opération de Coupage ou soudage	Dimension d'électrode ou Epaisseur de métal ou Intensité de courant	Nuance de de filtre oculaire
Brasage tendre au chalumeau	toutes conditions	2
Brasage fort au chalumeau	toutes conditions	3 ou 4
Oxycoupage		
mince	moins de 1 po. (25 mm)	2 ou 3
moyen	de 1 à 6 po. (25 à 150 mm)	4 ou 5
épais	plus de 6 po. (150 mm)	5 ou 6
Soudage aux gaz		
mince	moins de 1/8 po. (3 mm)	4 ou 5
moyen	de 1/8 à 1/2 po. (3 à 12 mm)	5 ou 6
épais	plus de 1/2 po. (12 mm)	6 ou 8
Soudage à l'arc avec	moins de 5/32 po. (4 mm)	10
electrode enrobées (SMAW)	de 5/32 à 1/4 po. (4 à 6.4 mm)	12
	plus de 1/4 po. (6.4 mm)	14
Soudage à l'arc sous gaz avec fil plein (GMAW)		
métaux non-ferreux	toutes conditions	11
métaux ferreux	toutes conditions	12
Soudage à l'arc sous gaz avec électrode de tungstène (GTAW)	toutes conditions	12
Soudage à l'hydrogène atomique (AHW)	toutes conditions	12
Soudage à l'arc avec électrode de carbone (CAW)	toutes conditions	12
Soudage à l'arc Plasma (PAW)	toutes dimensions	12
Gougeage Air-Arc avec électrode de carbone		
mince		12
épais		14
Coupage à l'arc Plasma (PAC)		
mince	moins de 300 ampères	9
moyen	de 300 à 400 ampères	12
épais	plus de 400 ampères	14

LES VAPEURS ET LES FUMEES SONT DANGEREUSES POUR LA SANTE.

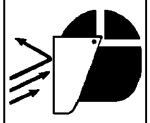
Le soudage dégage des vapeurs et des fumées dangereuses à respirer.

1. Eloignez la tête des fumées pour éviter de les respirer.
2. A l'intérieur, assurez-vous que l'aire de soudage est bien ventilée ou que les fumées et les vapeurs sont aspirées à l'arc.
3. Si la ventilation est inadequate, portez un respirateur à adduction d'air approuvé.
4. Lisez les fiches signalétiques et les consignes du fabricant relatives aux métaux, aux produits consummables, aux revêtements et aux produits nettoyants.
5. Ne travaillez dans un espace confiné que s'il est bien ventilé; sinon, portez un respirateur à adduction d'air. Les gaz protecteurs de soudage peuvent déplacer l'oxygène de l'air et ainsi causer des malaises ou la mort. Assurez-vous que l'air est propre à la respiration.
6. Ne soudez pas à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir avec des vapeurs et former des gaz hautement toxiques et irritants.
7. Ne soudez des tôles galvanisées ou plaquées au plomb ou au cadmium que si les zones à souder ont été grattées à fond, que si l'espace est bien ventilé; si nécessaire portez un respirateur à adduction d'air. Car ces revêtements et tout métal qui contient ces éléments peuvent dégager des fumées toxiques au moment du soudage.

LE SOUDAGE PEUT CAUSER UN INCENDIE OU UNE EXPLOSION

L'arc produit des étincellies et des projections. Les particules volantes, le métal chaud, les projections de soudure et l'équipement surchauffé peuvent causer un incendie et des brûlures. Le contact accidentel de l'électrode ou du fil-électrode avec un objet métallique peut provoquer des étincelles, un échauffement ou un incendie.

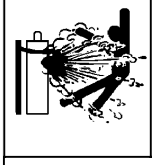
1. Protégez-vous, ainsi que les autres, contre les étincelles et du métal chaud.
2. Ne soudez pas dans un endroit où des particules volantes ou des projections peuvent atteindre des matériaux inflammables.
3. Enlevez toutes matières inflammables dans un rayon de 10, 7 mètres autour de l'arc, ou couvrez-les soigneusement avec des bâches approuvées.
4. Méfiez-vous des projections brulantes de soudage susceptibles de pénétrer dans des aires adjacentes par de petites ouvertures ou fissures.
5. Méfiez-vous des incendies et gardez un extincteur à portée de la main.
6. N'oubliez pas qu'une soudure réalisée sur un plafond, un plancher, une cloison ou une paroi peut enflammer l'autre côté.
7. Ne soudez pas un récipient fermé, tel un réservoir ou un baril.
8. Connectez le câble de soudage le plus près possible de la zone de soudage pour empêcher le courant de suivre un long parcours inconnu, et prévenir ainsi les risques d'électrocution et d'incendie.
9. Ne dégelez pas les tuyaux avec un source de courant.
10. Otez l'électrode du porte-électrode ou coupez le fil au tube-contact lorsqu'inutilisé après le soudage.
11. Portez des vêtements protecteurs non huileux, tels des gants en cuir, une chemise épaisse, un pantalon revers, des bottines de sécurité et un casque.



LES ETINCELLES ET LES PROJECTIONS BRULANTES PEUVENT CAUSER DES BLESSURES.

Le piquage et le meulage produisent des particules métalliques volantes. En refroidissant, la soudure peut projeter du éclats de laitier.

1. Portez un écran facial ou des lunettes protectrices approuvées. Des écrans latéraux sont recommandés.
2. Portez des vêtements appropriés pour protéger la peau.



LES BOUTEILLES ENDOMMAGEES PEUVENT EXPLOSER

Les bouteilles contiennent des gaz protecteurs sous haute pression. Des bouteilles endommagées peuvent exploser. Comme les bouteilles font normalement partie du procédé de soudage, traitez-les avec soin.

1. Protégez les bouteilles de gaz comprimé contre les sources de chaleur intense, les chocs et les arcs de soudage.
2. Enchainez verticalement les bouteilles à un support ou à un cadre fixe pour les empêcher de tomber ou d'être renversées.
3. Eloignez les bouteilles de tout circuit électrique ou de tout soudage.
4. Empêchez tout contact entre une bouteille et une électrode de soudage.
5. N'utilisez que des bouteilles de gaz protecteur, des détendeurs, des boyauxs et des raccords conçus pour chaque application spécifique; ces équipements et les pièces connexes doivent être maintenus en bon état.
6. Ne placez pas le visage face à l'ouverture du robinet de la bouteille lors de son ouverture.
7. Laissez en place le chapeau de bouteille sauf si en utilisation ou lorsque raccordé pour utilisation.
8. Lisez et respectez les consignes relatives aux bouteilles de gaz comprimé et aux équipements connexes, ainsi que la publication P-1 de la CGA, identifiée dans la liste de documents ci-dessous.

MISE EN GARDE

LES MOTEURS PEUVENT ETRE DANGEREUX

LES GAZ D'ECHAPPEMENT DES MOTEURS PEUVENT ETRE MORTELS.

Les moteurs produisent des gaz d'échappement nocifs.

1. Utilisez l'équipement à l'extérieur dans des aires ouvertes et bien ventilées.
2. Si vous utilisez ces équipements dans un endroit confiné, les fumées d'échappement doivent être envoyées à l'extérieur, loin des prises d'air du bâtiment.

LE CARBURANT PEUR CAUSER UN INCENDIE OU UNE EXPLOSION.

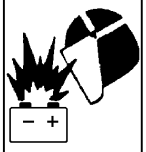
Le carburant est hautement inflammable.

1. Arrêtez le moteur avant de vérifier le niveau de carburant ou de faire le plein.
2. Ne faites pas le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
3. Si c'est possible, laissez le moteur refroidir avant de faire le plein de carburant ou d'en vérifier le niveau au début du soudage.
4. Ne faites pas le plein de carburant à ras bord: prévoyez de l'espace pour son expansion.
5. Faites attention de ne pas renverser de carburant. Nettoyez tout carburant renversé avant de faire démarrer le moteur.

DES PIECES EN MOUVEMENT PEUVENT CAUSER DES BLESSURES.

Des pièces en mouvement, tels des ventilateurs, des rotors et des courroies peuvent couper doigts et mains, ou accrocher des vêtements amples.

1. Assurez-vous que les portes, les panneaux, les capots et les protecteurs soient bien fermés.
2. Avant d'installer ou de connecter un système, arrêtez le moteur.
3. Seules des personnes qualifiées doivent démonter des protecteurs ou des capots pour faire l'entretien ou le dépannage nécessaire.
4. Pour empêcher un démarrage accidentel pendant l'entretien, débranchez le câble d'accumulateur à la borne négative.
5. N'approchez pas les mains ou les cheveux de pièces en mouvement; elles peuvent aussi accrocher des vêtements amples et des outils.
6. Réinstallez les capots ou les protecteurs et fermez les portes après des travaux d'entretien et avant de faire démarrer le moteur.



DES ETINCELLES PEUVENT FAIRE EXPLOSER UN ACCUMULATEUR; L'ELECTROLYTE D'UN ACCUMULATEUR PEUT BRULER LA PEAU ET LES YEUX.

Les accumulateurs contiennent de l'électrolyte acide et dégagent des vapeurs explosives.

1. Portez toujours un écran facial en travaillant sur un accumulateur.
2. Arrêtez le moteur avant de connecter ou de déconnecter des câbles d'accumulateur.
3. N'utilisez que des outils anti-étincelles pour travailler sur un accumulateur.
4. N'utilisez pas une source de courant de soudage pour charger un accumulateur ou survolter momentanément un véhicule.
5. Utilisez la polarité correcte (+ et –) de l'accumulateur.

LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT BRULANT SOUS PRESSION PEUVENT BRULER LA PEAU ET LES YEUX.

Le liquide de refroidissement d'un radiateur peut être brûlant et sous pression.

1. N'ôtez pas le bouchon de radiateur tant que le moteur n'est pas refroidi.
2. Mettez des gants et posez un torchon sur le bouchon pour l'ôter.
3. Laissez la pression s'échapper avant d'ôter complètement le bouchon.

PRINCIPALES NORMES DE SECURITE

Safety in Welding and Cutting, norme ANSI Z49.1, American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33128.

Safety and Health Standards, OSHA 29 CFR 1910, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33128.

National Electrical Code, norme 70 NFPA, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, document P-1, Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, norme CSA W117.2 Association canadienne de normalisation, Standards Sales, 276 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices for Occupation and Educational Eye and Face Protection, norme ANSI Z87.1, American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme 51B NFPA, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

DESCRIPTION OF EQUIPMENT

General

This unit is a constant voltage, transformer-rectifier type DC welding machine that provides volt-ampere characteristic curves that are basically flat. Its rated output is: 300 amperes, 32 volts DC, 9.6 kW, at a duty cycle of 100%. A low current tap is provided to produce a drooping characteristic for applications below 150 amps.

Table 3-1, following gives input voltage and amperage data for all specifications covered by this manual.

UNIT SPEC NUMBER	USABLE LINE VOLTAGES	INPUT AMPERAGE	HZ
	230	46	
6310	460	23	60
	200	53	
6311	230	46	60
6311A	460	23	
	230	46	
6312	460	23	60
6312A	575	18.5	
	220	44	
6313	380	25	50
	415	23	
	380	25	
6314	500	19	50

Table 3-1 Input Voltage/Amperage Data per Specs

Recommended Unit Applications

1. Gas metal arc welding (MIG)
2. Flux cored arc welding (with or without gas shielding)

Wire Feeder Compatibility

Thermal Arc wire feeders will connect onto this unit with no special preparation.

Controls and Outlets

Input Contactor Control — This toggle switch is the master power switch for the welding machine, and must be in the ON position before any other section will operate. The primary circuit of the control transformer is energized whenever line voltage is present at the input terminals. This switch closes the secondary circuit of the control transformer, energizing the contactor, which energizes the power transformer. Do not use this switch to start or stop arc. Start arc with switch ON, break arc, then turn switch OFF. Indicator Lamp will be ON when switch is in the ON position..

Local/Remote Voltage Control Selector Switch — Selects either the voltage control (Local) or some remote control device (Remote) to control welding voltage.

Welding Voltage Control — Adjusts arc welding output and open circuit voltage. Open circuit voltage is approximately 1.5 times the welding voltage for constant voltage welding.

Voltmeter — Monitors open circuit voltage and welding voltages anytime secondary circuit is closed.

Ammeter —- Monitors the current flowing through the welding arc.

Positive Terminal (+) — Serves as a connection point for the lead to the workpiece when straight polarity is desired.

NOTE: To obtain opposite welding polarity, simply reverse the connections to the positive and negative terminals.

Low Current Tap — A low current tap is available to provide the user with maximum output current of 150 A with ballast resistor shunting for improved low current weldability.

Voltage Sensing Switch (Local-Remote) — This switch selects the feed back mode. In LOCAL position, regulation of the output is taking place at the output terminals of the welding machine. In REMOTE position, regulation can be accomplished at the actual welding location. A remote voltage sensing type wire feeder is normally used with switch in REMOTE position.

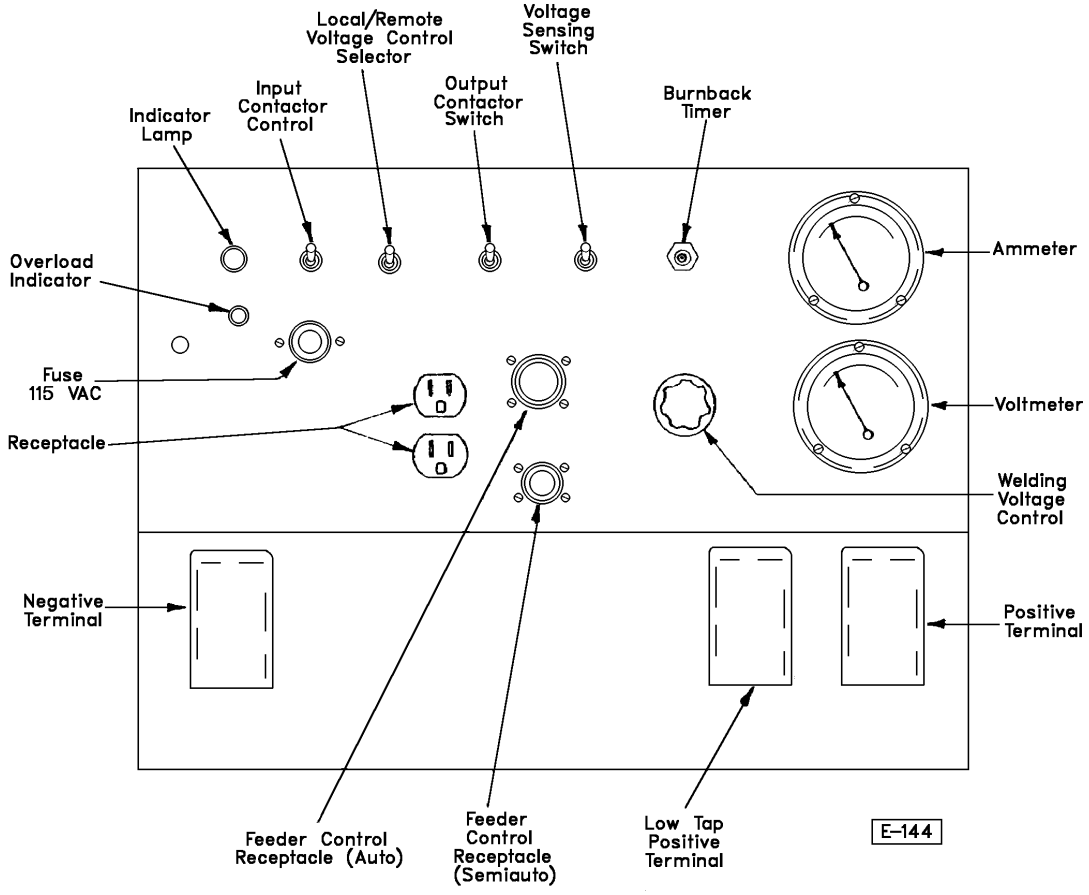


Figure 3-1 Control Panel

Feeder Control Receptacle (Automatic) — Connection point for a remote voltage-control type wire feeder control (19-pin).

Feeder Control Receptacle (Semiautomatic) — Serves as a connection point for the control cable from semiautomatic wire feeders only (5-pin).

NOTE: Only one feeder control receptacle is used at any one time.

Fuse — Protects the 115-V AC control circuitry and the 115-Volt receptacles. Replace only with a fuse of a size as marked on the fuseholder cap.

115-V AC Receptacles — Provides auxiliary power for lights, wire feeders, water pumps, etc. Fused for 15 amperes.

Negative Terminal (–) — Serves as a connection point for the lead from welding gun, or workpiece depending on polarity or mode of welding operation.

Output Contactor Switch — This toggle switch controls current to the P.C. Board that controls the SCRs. In the ON position the SCRs are “firing” constantly. In the OFF position, the SCRs are “fired” during the part of the power cycle necessary to provide the controlled welding conditions for wire electrode welding.

Burnback Timer Control — This potentiometer setting controls length of burnback (meltback) time at conclusion of arc cycle. (prevents wire electrode from “freezing” in the weld puddle.)

Overload Indicator — When lighted, indicates that machine has shut down as a result of output overload.

NOTE: A thermostatically controlled fan motor is optional, which may be incorporated into the system, which starts and stops automatically when a predetermined temperature has been reached.

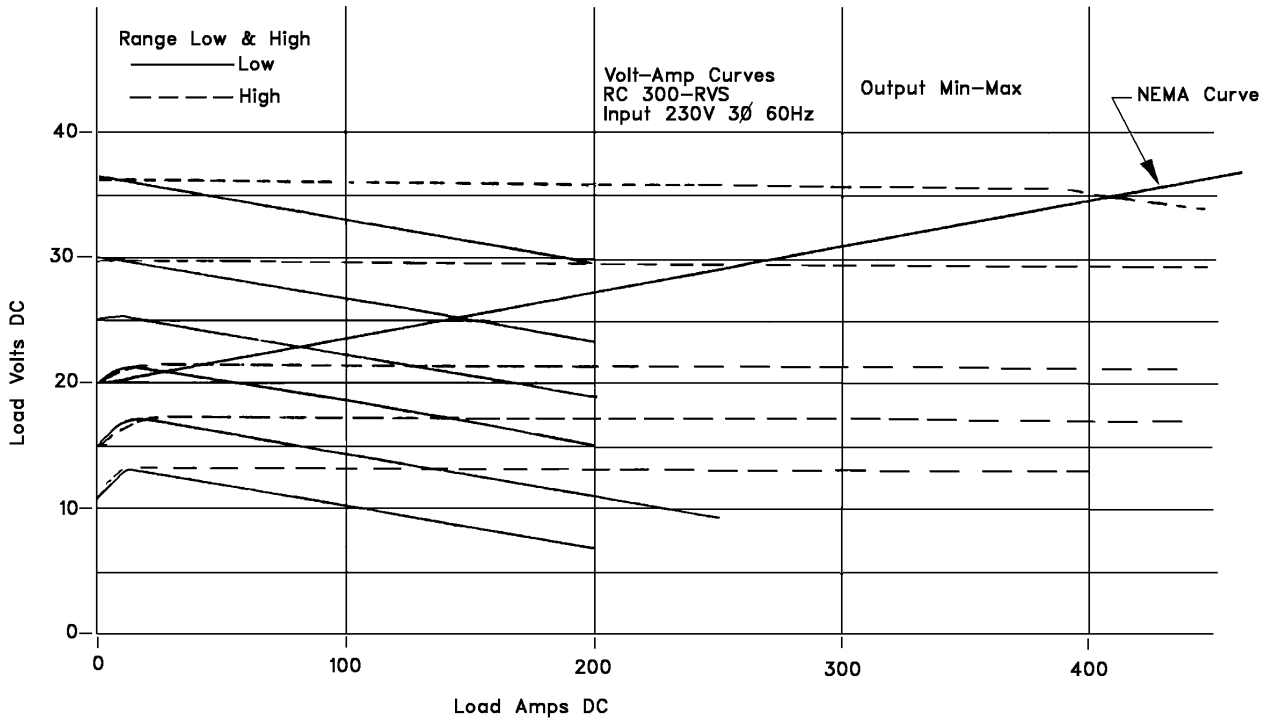


Figure 3-2 Volt-Amp Characteristic Curve

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INSTALLATION

Location

For best operating characteristics and longest unit life, take care in selecting an installation site. Avoid locations exposed to high humidity, dust, high ambient temperature, or corrosive fumes. Moisture can condense on electrical components, causing corrosion or shorting of circuits. Dirt on components helps retain this moisture.

Adequate air circulation is needed at all times in order to assure proper operation. Provide a minimum of 12 inches (305 mm) of free air space at both front and rear of the unit. Make sure that the ventilator openings are not obstructed.

Internal Wiring Check

Refer to the product identification plate (nameplate) on the welding machine's control panel to determine the power input voltages and frequency at which it will be operated.

Remove cabinet top for access to LINE VOLTAGE CHANGEOVER circuitry. Check line voltage connections against instructions on VOLTAGE CHANGEOVER DIAGRAM supplied with this manual. If necessary, rearrange internal wiring and/or link connections.

Connecting Welding Machine to Line Voltage

The input power should be connected to the unit through a fused disconnect switch, or other suitable disconnecting means furnished by the user. A hole is provided in the rear panel of the machine, near to the input connections, for the entry of the input conductors.

DANGER: ELECTRIC SHOCK CAN KILL. Open the disconnect switch, or breaker, and determine that no voltage is present, before connecting wires between welding machine and power supply.

CAUTION: The method of installation, conductor size, and overcurrent protection shall conform to the requirements of the local electrical code, the National Electrical Code, or other national codes, as applicable. All installation wiring and machine reconnection shall be done by qualified persons.

Table 4-1 provides minimal information for selection of line conductors, fuses, and the equipment grounding conductor. This information is from the National Electrical Code NFPA 70-1981 Edition. Install this equipment per the latest edition, available from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

Connect the three-phase line leads to terminals L1, L2, and L3 on the line contactor inside the welding machine cabinet.

Grounding

The frame of this welding machine should be grounded for personnel safety, and to assure operation of the overcurrent protection. The grounding method, and the equipment grounding conductor size and type shall conform to local and national codes.

For the National Electrical Code, the equipment grounding conductor shall be green, green with a yellow stripe, or bare.

If flexible power cable is used, use a cable assembly which includes the equipment grounding conductor. If metallic armored cable or conduit is used, the metal sheathing or conduit must be effectively grounded per local and national codes.

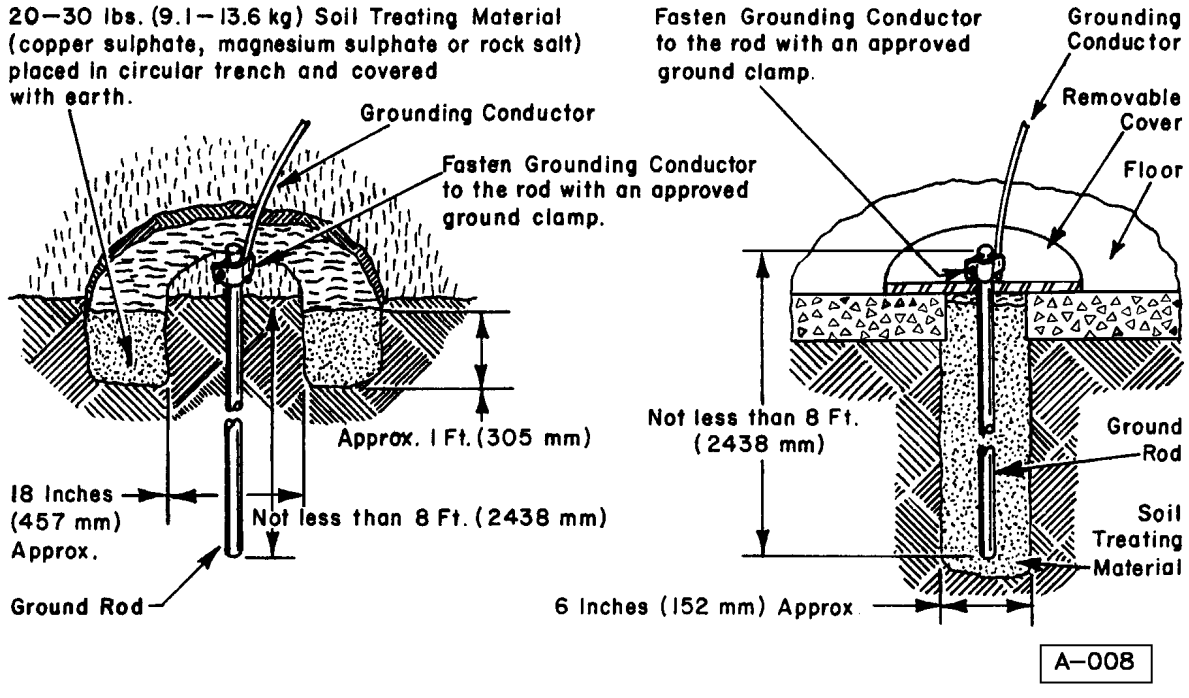
Rubber-tire mounted equipment shall be grounded to conform to local and national codes. The grounding assists in providing protection against line voltage electrical shock and static shock. The grounding serves to discharge the static electric charge which tends to build up on rubber-tire mounted equipment. This static charge can cause painful shock and lead to the erroneous conclusion that an electrical fault exists in the equipment.

If a system ground is not available, consult the electrical code enforcement body for instructions.

Line Volts	Rated Load Amps	Approx. Line Fuse size	Copper Line Wire Size*		Copper Grounding Conductor Min. Size
			In Conduit	Flexible Cable	
200	48	100	No. 8	No. 4	No. 8
220	44	60	No. 8	No. 6	No. 10
230	42	60	No. 8	No. 6	No. 10
380	25	40	No. 10	No. 10	No. 10
415	23	40	No. 10	No.10	No. 10
460	21	40	No. 10	No. 10	No. 10
500	19	30	No. 12	No. 12	No. 10
575	17	30	No. 12	No. 12	No. 10

Table 4-1 Recommended Wire and Fuse Size Table

**Conductor size shall be modified as required for line voltage drop and ambient temperature. Sizes listed for conduit installation are based on 90°C conductor insulation, designated as FEP, FEPB, RHH, and THHN.*


20—30 lbs. (9.1—13.6 kg) Soil Treating Material (copper sulphate, magnesium sulphate or rock salt) placed in circular trench and covered with earth.
Grounding Conductor
Fasten Grounding Conductor to the rod with an approved ground clamp.
Approx. 1 Ft. (305 mm)
18 Inches (457 mm) Approx.
Not less than 8 Ft. (2438 mm)
Ground Rod
Fasten Grounding Conductor to the rod with an approved ground clamp.
Grounding Conductor
Removable Cover
Floor
Not less than 8 Ft. (2438 mm)
Ground Rod
Soil Treating Material
6 Inches (152 mm) Approx.
A—008

Outside Ground

Inside Ground

Figure 4-1

The welding machine should be connected to an adequate driven ground rod, or to a water pipe that enters the ground not more than 10 feet (30 meters) from the machine.

The equipment grounding conductor size is listed in Table 4-1 as a guide if no local or national code is applicable.

Attach the equipment grounding conductor to the stud provided adjacent to the contactor. Determine that the ground wire size is adequate, before the machine is operated.

CAUTION: Be sure to replace the cabinet top to assure adequate internal ventilation and prevent component failure.

Welding Leads

Use Table 4-2 for selection of the proper size copper welding leads.

Welding Current Amperes	TOTAL LENGTH OF LEAD CIRCUIT IN FEET (AND METERS) (ELECTRODE LEAD PLUS WORK LEAD)				
	50 Feet (15.2 M)	100 Feet (30.5 M)	150 Feet (45.7 M)	200 Feet (61.0 M)	250 Feet (76.2 M)
100	#4	#4	#2	#1	#1
150	#2	#2	#1	#1/0	#2/0
200	#1	#1	#1/0	#2/0	#3/0
250	#1/0	#1/0	#2/0	#3/0	#4/0
300	#2/0	#2/0	#3/0	#4/0	2 – #2/0
350	#3/0	#3/0	#4/0	2 – #2/0	2 – #3/0
400	#4/0	#4/0	#4/0	2 – #2/0	2 – #3/0
500	#4/0	#4/0	#4/0	2 – #2/0	2 – #3/0

NOTE: Lead size shown is for 90°C (194°F) insulation, 30°C (86°F) ambient, and not over 4.5 volts lead drop.

Table 4-2

Connection to Certain Automatic Wire Feeders and/or Control Panels

When connecting a non-compatible wire feeder or control panel, an interface box must be connected between it and the welding machine with the interface box cable connecting to the terminal block inside welding machine.

OPERATION

General

Before operating this system, be sure that all installation instructions have been accomplished. When operating this system, observe all applicable SAFETY WARNINGS listed in the Safety Warnings chapter in this manual and related system manuals.

The operating instructions in this manual pertain only to the Mega-Mig® 300-RVS welding machine. Consult operating instructions for components used with this system before operating.

Preweld Operation

1. Connect welding leads to terminals on front of panel.

WARNING: Disconnect line voltage from the unit before making any connections inside unit. Turn off fused disconnect switch that supplies power to welding machine, and remove its fuses.

2. If used, connect remote control wire assembly and gun switch to welding machine. Connect feeder receptacle to wire electrode feeder system.

3. Refer to other manuals for component connections.

4. Set Output Voltage Control to desired value.

5. Set Output Contactor Switch, Remote/Local Voltage Control Selector Switch, and Voltage Sensing Switch (Remote/Local) to desired mode.

Welding, Semiautomatic or Automatic

1. Set Remote/Local Voltage Control Switch, and Voltage Sensing Switch to LOCAL.

NOTE: Set Voltage Control Switch to REMOTE when using a feeder which controls the voltage, and remote voltage control is desired. Set Voltage Sensing Switch to REMOTE when using a feeder which provides voltage sensing at the actual welding location. If the Voltage Sensing Switch is placed in the REMOTE position, and the voltage sensing leads are not connected at the welding location, the output of the welding machine will go to maximum amperage.

2. Set Output Contactor Switch to OFF position.

3. Place Input Contactor Control Switch in ON position (Power ON).

4. Inch wire electrode to position over work; see related technical manuals.

5. Depress gun switch trigger and strike arc.

6. At conclusion of welding, release gun switch trigger and hold gun in position until contactor releases and gas flow stops. Turn Power Switch OFF.

Low Tap Operation

The low tap on the power source can be used for current below 150 amperes. It is intended to provide better arc characteristics at low voltages and current. Depending on application, either the low tap or the high tap can be used below 150 amperes. In some applications, the low tap may be preferred, in other applications the high tap may be desired.

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MAINTENANCE

Replacing SCRs

Replacing an SCR is a critical task but it can be accomplished in the field by following the instructions in the DETAILED TROUBLESHOOTING INSTRUCTIONS located in the Troubleshooting chapter of this manual.

Lubrication

The fan motor incorporates a sleeve bearings. You can expect the life of this motor to exceed 50,000 hours without relubrication. Periodically cleaning the motor and lubricating the bearings will extend the life of the motor. The following table will furnish a recommended guide to the frequency of this lubrication if desired.

Type of Duty	Lubrication Interval
Light (up to 6 hrs./day)	Every 12 months
Moderate (7 to 15 hrs./day)	Every 6 months
Heavy (16 to 24 hrs./day)	Every 3 months

NOTE: Apply 1-12 drops of 20W non-detergent oil at each end of bearing.

Inspection and Cleaning

For uninterrupted, satisfactory service from this welding machine, it is necessary to keep the machine clean, dry, and well ventilated. At least every three months, or more often as necessary, wipe and blow out all dirt from the machine's internal components, with air pressure of not over 25 psi (172 kPa). Be sure to wipe the fan blades clean.

Check and tighten all electrical connections as necessary to eliminate unnecessary losses and to avoid subsequent trouble from overheating or open circuits. Check for broken wiring or damaged insulation on wiring.

CAUTION: The flow of air through the welding machine is carefully directed by baffles. Never operate the welding machine with any of the side or top panels removed or open, as serious damage to the unit might result.

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TROUBLESHOOTING

The following chart contains information which can be used to diagnose and correct unsatisfactory operation or failure of the various components of the welding generator. Each symptom of trouble is followed by a list of probable causes and the procedure necessary to correct the problem. Also refer to TROUBLESHOOTING in wire feeder and gun manuals.

Troubleshooting Guide

Welding machine will not start.

Power switch OFF

Place power switch in ON position.

Power lines dead

Check voltage.

Broken power lead

Repair.

Wrong line voltage

Check power supply.

Incorrect input power connections at welding machine

Check connections against wiring diagram.

Blown fuses

Remedy cause. Refer to DETAILED TROUBLESHOOTING INSTRUCTIONS.

Open circuit to power switch or control transformer

Repair. Check for broken wire or loose connections at terminals.

Fuse on control transformer blown

Remedy cause. Replace fuse.

Line contactor fails to close

Defective coil

Replace.

Mechanical obstruction on contactor

Remove.

Broken leads at line contactor

Repair.

Contactor chatters

Line leads too small

Use larger leads.

Low line voltage

Check line voltage.

Magnet face dirty

Clean with paper. DO NOT GRIND or use abrasive material.

Contactor operates and blows link fuses

Wrong line voltage

Check nameplate of welding machine for line voltage to use; check line voltage.

Links on voltage changeover board incorrectly connected

Check VOLTAGE CHANGEOVER diagrams for link positions; connect links correctly. See under "DIAGRAMS" .

Line fuse too small

Install proper size fuse.

SCR failure

Refer to DETAILED TROUBLESHOOTING INSTRUCTIONS.

Short circuit in primary connections

Remove short circuit.

Transformer failed

Repair or replace.

Unit delivers welding current but soon shuts down

Welding machine overloaded

Reduce load, overload can be carried only for a short time.

Duty cycle too high

Do not operate continually at overload currents.

Power leads too long or too small in cross section

Replace with larger diameter cable.

Ambient temperature too high

Operate at reduced loads when temperature exceeds 104°F (40°C).

Ventilation blocked

Check air intake and exhaust openings to be unobstructed.

Fan not operating

Check bearings, disconnect leads and apply motor nameplate voltage to test.

Solid-state contactor operates, but welding machine will not deliver welding current, and open circuit voltage is present at the output when gun switch is depressed.

No ground connections at work

Make connections.

Welding cables not connected

Make connections.

Fine voltage dial does not control welding voltage

Potentiometer burned out

Replace.

Loose connections in voltage control circuit

Check connections.

Control circuit board failure

Refer to DETAILED TROUBLESHOOTING INSTRUCTIONS.

Fan not operating (also see causes and remedies under “Welding machine will not start”)

Motor failed

Replace or repair.

Broken lead or connection to fan motor

Repair wiring.

Blown fuse on front panel of welding machine

Replace; 115-volt receptacle may be overloaded.

Operator gets shock when welding machine case, ground cable, work, or work table is touched.

Case of welding machine not grounded

Ground welding machine case.

Work table and work not grounded

Ground work and work table to plant ground.

Abnormal current fluctuation, voltage nearly constant

Irregular wire feed speed

See welding head manual.

Inadequate shielding of arc by flux or gas

Increase shielding by trial and error. See welding head manual.

Wire feed rate too slow

Increase wire feed. See wire burn-off rate charts.

Too much shielding gas

Decrease by trial and error. See welding head manual.

Loose cable connections

Check for overheated connections and tighten.

Welding contact tube (tip) on wire feeder makes poor contact with electrode

Check contact tube hole size and replace with proper tube.

Contactor fails to open.

Contactor contacts sticking

Clean contacts.

Very noticeable, rough, sputtering arc. Loss of control and burnback. Minor starting problems.

Control circuit board failure

Refer to DETAILED TROUBLESHOOTING INSTRUCTIONS.

Output of welding machine goes to maximum, and there is no control.

Voltage sensing lead not connected

Connect lead.

Detailed Troubleshooting Instructions

The Mega-Mig® 300-RVS is a solid-state welding machine. The method of troubleshooting is different, but is not more difficult than troubleshooting a conventional unit. Do not overlook the obvious. As in the case of all electrical equipment, loose connections are the primary cause of malfunction both internal and external to the welding machine. Do not overlook bad grounds, worn contact tubes (tips), dirty cable liners, shorted control cables, wrong settings, blown fuses, worn contactors, misconnections from feeding equipment, misapplication, etc. The only equipment needed to properly detect a problem on this welding machine is a simple voltohmmeter, although an oscilloscope is the best method to quickly "see" the problem.

Voltages of Interest — Refer to Connection Diagram.

1. Across the secondary on all 3 phases — 20 V AC ± 10%.

NOTE: The ± 10% refers to the possibility of having a high or low input line voltage.

2. 115 V Receptacles — 115 V AC ± 10%.

3. X1-X3 or X5 on fuse block — 17 V AC ± 10%.

Control Circuit Board Malfunction — If a board malfunction occurs, the following situations will probably result:

1. Loss of arc completely.

2. Very noticeable, rough, sputtering, etc.

3. Loss of control and burnback.

4. Minor starting problems.

SCR Malfunction — If one or more SCRs malfunction, the following situations will probably result:

1. Blown line fuses as the result of a shorted SCR (similar to a shorted diode).

2. If one SCR does not turn on [either it is open or the gate signal is not being received by the SCR (gate circuit open)], a very small change will occur at the arc and will be difficult to notice by the average operator. Generally when this happens, it will be necessary to adjust the voltage control on the front of the welding machine (turn it up) to obtain the same arc that was being produced before the defect occurred.

3. If two SCRs do not turn on, the arc becomes more erratic and unstable.

Component Testing

1. In the case of a severe malfunction, such as a shorted SCR or diode, do not turn on the unit. Disconnect the leads from the transformer to the heat sink assembly and check with a VOM for shorted SCRs or a shorted flyback diode.

2. If the welding machine is suspected, a very simple test can tell you a great deal about it. Simulate gun switch closing and observe the open circuit voltage. This can be done by putting the Output Contactor switch in the ON position. This voltage should vary from 10V DC to 35V DC ± 10%, as the voltage control is rotated from min. to max. slowly. If this voltage varies smoothly, there is a strong possibility that nothing has malfunctioned in the welding machine. If the voltage varies erratically and does not come close to the values listed, you probably have a control circuit board problem. If the voltage variation is somewhat smooth, but does not reach the maximum value, you probably have an SCR problem.

3. The next step is to go inside the unit and check the control circuit board. See the instructions provided for this test. It is important to run through the tests in the order they are listed.

4. If nothing is found defective on the board the next step is to go to the SCRs. First of all an open gate or an open SCR *cannot* be checked with a VOM. If an SCR is not firing, the open circuit voltage (OCV) will shift down. Check the following table for typical values:

a. All SCRs firing properly — max. OCV = 35V DC.

b. 1 SCR not firing — max. OCV = 31.5 ±3V DC.

c. 2 SCRs not firing — max. OCV = 28 ±3V DC.

d. If 2 SCRs not firing in same phase, OCV = 22 V ±3V DC.

NOTE: These voltages were recorded at nominal line voltage with voltage control adjustment at MAXIMUM setting.

The best way to isolate the particular SCR which is malfunctioning is as follows. Refer to Connection Diagram while inspecting the unit. On the output rectifier there are gate leads coming off of the SCRs. Each of these leads are connected to a quick-disconnect terminal on the suppressor board. Turn the voltage control pot to maximum. Disconnect one lead to one SCR and observe the OCV. If the OCV drops to a lower value, this indicates that this particular SCR is working properly. *Reconnect this lead* and do the same thing with the remaining leads until you discover which disconnection does *not* cause the OCV to drop to a lower level. This is the malfunctioning SCR. See Mounting Procedures for SCRs which follows.

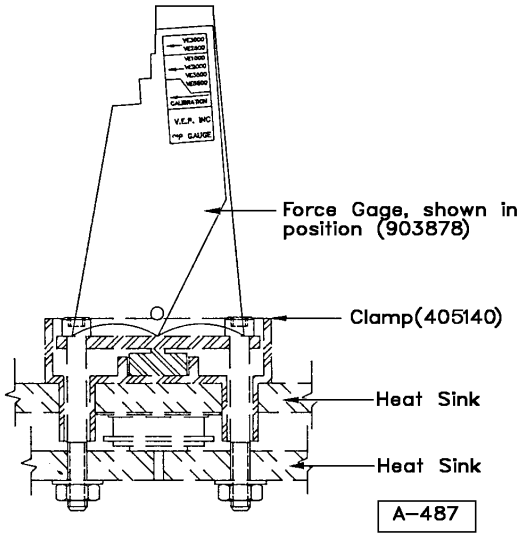


Figure 7-1

Mounting Procedure for SCRs

1. Thoroughly clean heat sink surface to eliminate any dirt or contamination.

2. Apply a thin coat of Alcoa #2 compound to cleaned surface. Alcoa #2 is available from Thermal Arc, part number 903870.

3. Positively locate the SCR in place in the heat sink. A small spring pin in the extruded heat sink will locate the SCR.

4. Place the clamp in position with the bolts through the holes in the heat sink, and proceed in following manner.

5. Tighten the nuts evenly until finger tight.

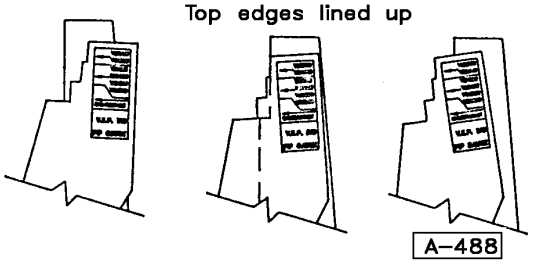
6. Tighten each bolt in 1/4 turn increments using correct size hex key.

7. Place the Force Indicator Gauge (903878) firmly against the springs as shown. Be sure both ends and the center are in firm contact with the springs. The gauge notch location will indicate the spring deflection or force. Correct mounting force is indicated as shown below.

8. Spring deflection over 2-1/4 inches of spring is .037" ± .002" for all clamps.

9. All clamps to be set at 4° mark. This corresponds to the VE3000-VE2500 section on the gauge label.

Examples:

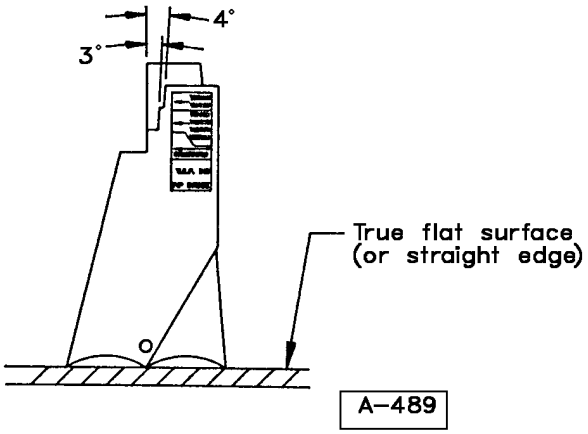


Less than rated force. Tighten nuts alternately 1/4 turn at a time until points coincide.	Correct rated force.	Excessive force. Loosen both nuts and start over. Never adjust force by backing off the nuts. Friction will produce a false reading. Always start from Step 1.

Figure 7-2

To Calibrate Force Gauge:

If the gauge is suspected of being out of calibration due to wear or damage, check it on a flat surface as shown below.



If the calibration edges do not line up, calibrate the gauge by filing the bottom contact points.

Figure 7-3

Testing Procedures (Printed Circuit Board)

See Figure 7-4.

Test point 2 (13) is the common ground and the negative probe should be connected to this point unless otherwise specified. All test readings are based on the line voltage supply being within specifications, that is, not exceeding ± 10% of nominal line voltage. For example, on a 460-volt, 3-phase line, the line voltage must not exceed 504 volts, or be less than 414 volts. The term OCV is open circuit voltage and refers to the welding terminals condition for the specific tests. Step (test) #17 requires that the welding terminals be connected to a resistance load. Check all connections to PC Board and be certain that AC input is present.

If the PC Board fails any of the tests, there is a strong possibility that the Board is defective.

Adjustments (Preset at factory) — The following describes the factory adjustments. It is not intended that the adjustments be made in the field. Refer to Figure 7-4 for reference to P.C. Board (369300). Specific adjustment components are identified by callout numbers, e.g. (1) in text.

1. Balance Adjustment for Conduction Angle of SCRs — The potentiometers R27A (5) and R27B (5) are used to adjust the balance.

2. Starting Circuit Adjustment — Potentiometer R18A (15) is used to adjust the starting circuit.

3. Maximum Voltage Adjustment — Potentiometer R33A (18) and/or R33B (19) are used to set maximum voltages.

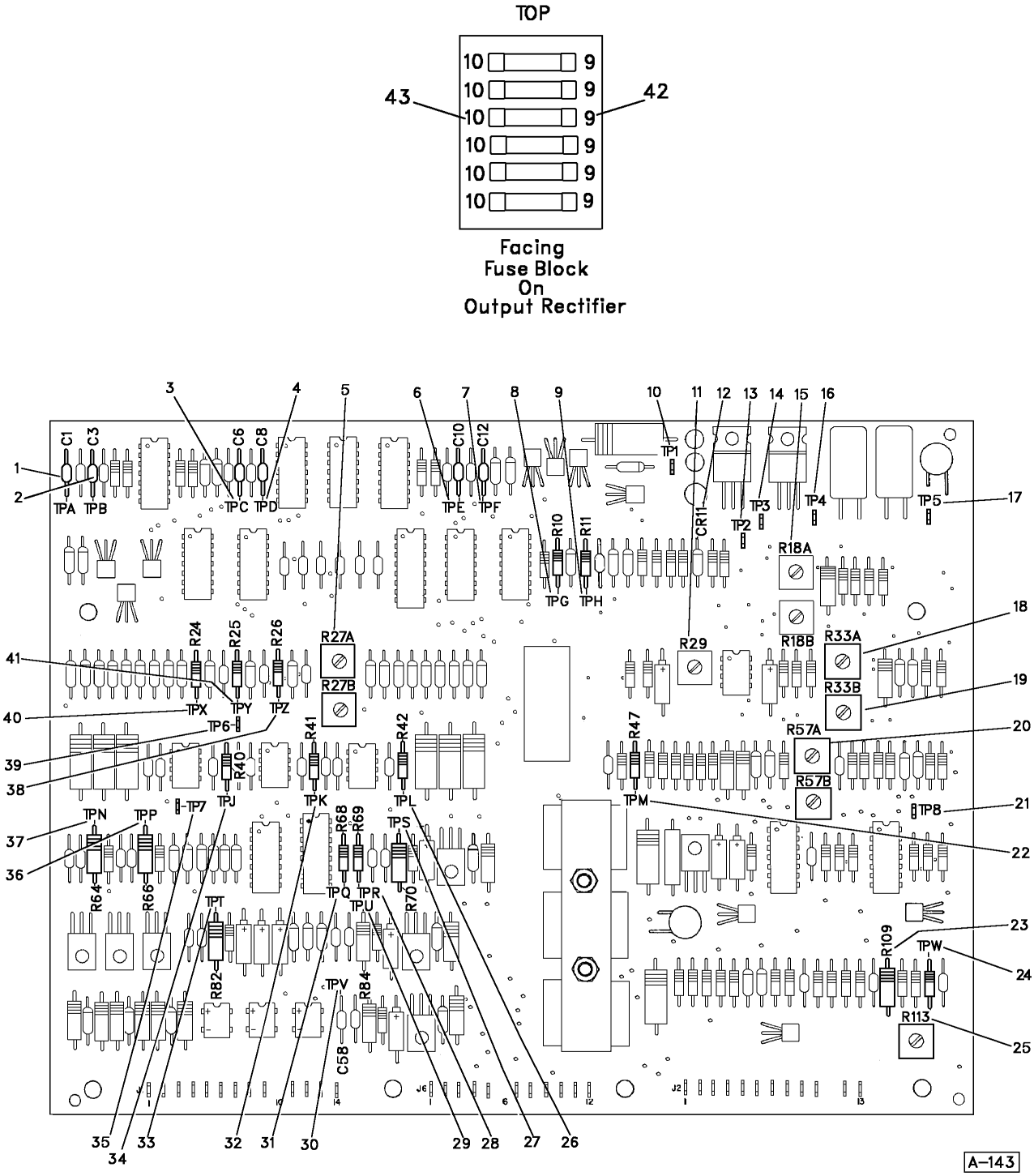
4. Minimum voltage adjustment potentiometer R113 (25) is used to set the minimum voltage.

5. Reference voltage adjustment potentiometer R57A (20). Adjusts the reference circuit.

6. Start gain adjustment potentiometer R29 (11) — Adjusts the start gain circuit.

7. Overload calculation potentiometer R57B (20) — Adjusts the overload circuit.

8. Burnback calibration potentiometer R18B (15) — Adjusts the burnback calibration.



R27Balance Adjustments (5)
R29Start Gain Adjustments (11)
R18AVoltage Trip Adjustment
R18BBurnback Adjustment
R33A+Maximum (18)
R33B –Maximum (19)
R57A Reference Voltage Adjustment (20)
R57B Overload Adjustment (20)
R113 Minimun Voltage Adjustment (25)

Figure 7-4 PC Board Test Points (TP) and Adjustment Controls

*NOTE: The following tests are made with the Output Contactor Switch set to OFF for A-B open conditions, or set in ON position for OCV conditions. *Test point locations are identified on Fig. 7-4 by callout numbers, e.g. (1).*

Test	Test Points	Voltage	Conditions	Remarks
1	(42) 9-2 (13) 9-2 (13) 9-2 (13)	17 ± 10% AC 17 ± 10% AC 17 ± 10% AC	OCV	Checks input to fuses (TP9 on fuse block)
2	(43) 10-2 (13) 10-2 (13) 10-2 (13)	17 ± 10% AC 17 ± 10% AC 17 ± 10% AC	OCV	Checks continuity of fuses (TP10 on fuse block)
3	(14) 3-2 (13)	+15 ± 10% DC	OCV	Checks positive supply voltage
4	(16) 4-2 (13)	+15 ± 10% DC	OCV	Checks negative supply voltage (negative probe on J)
5	(1) A-2 (13) (2) B-2 (13) (3) C-2 (13) (4) D-2 (13) (6) E-2 (13) (7) F-2 (13)	7.8 ± 5% DC 7.8 ± 5% DC 7.8 ± 5% DC 7.8 ± 5% DC 7.8 ± 5% DC 7.8 ± 5% DC	OCV	Checks output of op. amp.
6	(1) A-2 (13) (2) B-2 (13) (3) C-2 (13) (4) D-2 (13) (6) E-2 (13) (7) F-2 (13)	11 ± 5% DC 11 ± 5% DC 11 ± 5% DC 11 ± 5% DC 11 ± 5% DC 11 ± 5% DC	OCV	Checks output of op. amp. (voltage control set to minimum)
7	(40) X-2 (13) (41) Y-2 (13) (38) Z-2 (13)	2.9 ± 10% DC 2.9 ± 10% DC 2.9 ± 10% DC	OCV	Checks output of timer (voltage control set to maximum)
8	(40) X-Y (41) (40) X-Z (38) (41) Y-Z (38)	0 ± .25% DC 0 ± .25% DC 0 ± .25% DC	OCV	Checks output waveform balance
9	(37) N-2 (13) (36) P-2 (13) (27) S-2 (13) (33) T-2 (13) (29) U-2 (13) (30) V-2 (13)	19.7 ± 10% DC 19.7 ± 10% DC 19.7 ± 10% DC 19.7 ± 10% DC 19.7 ± 10% DC 19.7 ± 10% DC	OCV	Checks firing circuit (voltage control set to maximum)
10	(9) H-2 (13)	3.7 ± 5% DC	OCV	Checks op. amp. (voltage control set to maximum)
11	(9) H-2 (13)	1.6 ± 5% DC	OCV	Checks op. amp. (voltage control set to minimum)
12	(23) R109-2 (13)	2.3 ± .05% DC	OCV	Checks input to op. amp. (negative probe on 10) (voltage control set to minimum)
13	(23) R109-2 (13)	8.1 ± .05% DC	OCV	Checks input to op. amp. (negative prove on 10) (voltage control set to maximum)
14	(8) G-2 (13)	0.0 DC	OCV	Checks op. amp.
15	(8) G-2 (13)	13.5 ± 5% DC	A-B open	Checks op. amp. A-B circuit open
16	(12) CR11-2 (13)	0.0 DC	OCV	Checks starting cirucit A-B
17	(12) CR11-2 (13)	14 ± 5% DC	25 amps or above (HIGH TAP)	Checks starting circuit under load Greater than 50 amps (welding terminals connected to load)
18	(24) W-2 (13)	8.18 ± .02% DC	OCV	Checks reference voltage (negative probe on point 11)

Table 7-1

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PARTS LIST

Equipment Identification

All identification numbers as described in the Introduction chapter must be furnished when ordering parts or making inquiries. This information is usually found on the nameplate attached to the equipment. Be sure to include any dash numbers following the Specification or Assembly numbers.

How To Use This Parts List

The Parts List is a combination of an illustration (Figure Number) and a corresponding list of parts which contains a breakdown of the equipment into assemblies, subassemblies, and detail parts. All parts of the equipment are listed except for commercially available hardware, bulk items such as wire, cable, sleeving, tubing, etc., and permanently attached items which are soldered, riveted, or welded to another part. The part descriptions may be indented to show part relationships.

To determine the part number, description, quantity, or application of an item, simply locate the item in question from the illustration and refer to that item number in the corresponding Parts List.

An “Application Code” is used to distinguish parts that are applicable only to certain Specifications and/or Assemblies. This code is found in the rightmost column of the Parts List. If an item in the Parts List applies to all Specifications or Assemblies, the word “ALL” will be in the Application Code column. Refer to the following list to determine the appropriate Application Codes for the Specifications or Assemblies covered by this manual. If only the assembly or specification number is listed, the use of an Application Code does not apply to this manual.

SPECIFICATION NUMBER	APPLICATION CODE
6310-1	**A**
6311-1	**B**
6312-1	**C**
6313-1	**D**
6311A-1	**F**
6312A-1	**G**

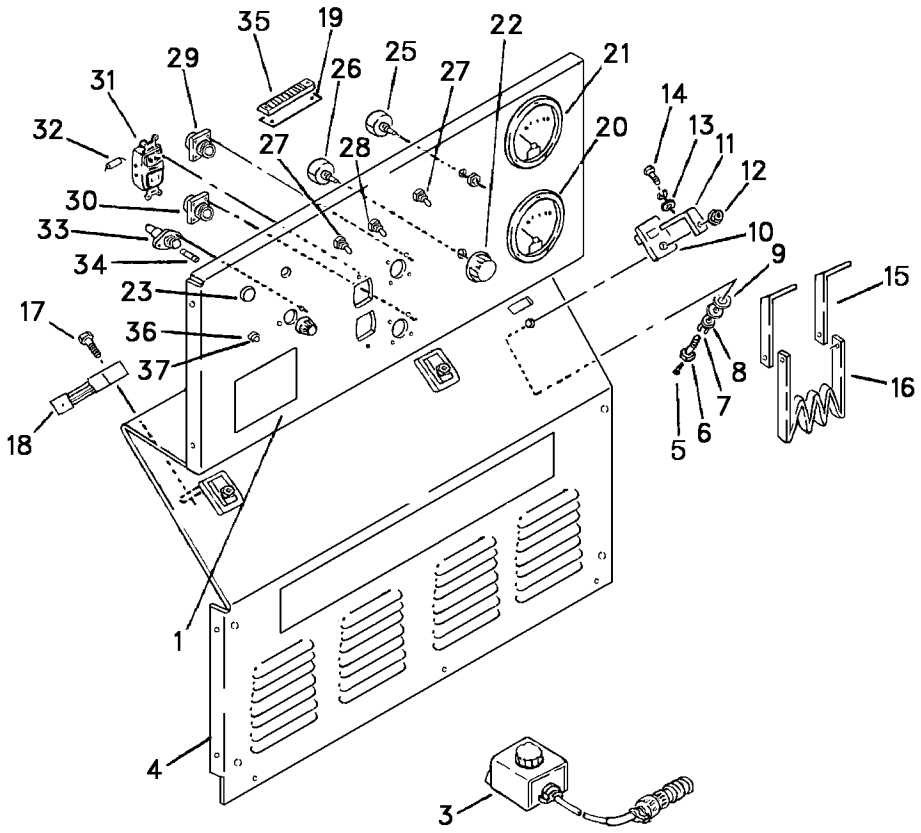


Figure 8-1 Control Panel

Parts List for Figure 8-1

Item No	Part Number	Description	Qty per Assy	Application Code
1	407961A-1	Nameplate - Serial	1	All
2	Delete			
3	200156	Kit - Remote Pendant (Optional)	Ref.	All
	369735-6	Panel - Front, Assembly	1	ABCDE
	369735-12	Panel - Front, Assembly	1	FG
4	369736-4	. Panel - Front, Control	1	ABCDE
	369736-7	. Panel - Front, Control	1	FG
5	No Number	. Screw - #6-32 x 3/16, Rd. Hd. MH. Hd. St.	3	All

Parts List for Figure 8-1

Item No	Part Number	Description	Qty per Assy	Application Code
6	351505	. Screw - 1/2 - 13 x 1-3/4 HHC (Drilled for item 5)	3	All
7	No Number	. Washer - 1/2, LK, ST.	6	All
8	No Number	. Washer - 1/2, Flat, Steel	3	All
9	5CS-976A	. Washer - Insulator, Cable Stud	6	All
10	5CW-975	. Bushing - Insulator	3	All
11	5CW-974	. Bus - Cable, Stud	3	All
12	No Number	. Nut - 1/2 - 13, Hex Flanged Hd.	3	All
13	No Number	. Washer - 1/2 Flat Steel	3	All
14	No Number	. Screw - 1/2 - 13 x 1 HHC, Steel	2	All
15	369744	. Bus - Mtg. Resistor	2	All
16	350853	. Resistor - Ballast	1	All
17	No Number	. Screw - 1/2 - 13 x 1-1/2 HHC, St.	1	All
18	CW-1142A	. Shunt	1	All
19	406354	. Nameplate - Term. Strip	1	All
20	400642-3	. Voltmeter	1	All
21	400641-6	. Ammeter	1	All
22	406162	. Knob - Control	1	ABCDE
	408850-5	. Knob - Control	1	FG
23	402421-2	. Light - Pilot	1	All
24	Delete			
	369814	. Harness - Wire, W/Components	1	All
25	400698-3	. . Potentiometer - 2 Watt, 250 K	1	All
26	401428-8	. . Potentiometer - 2 Watt, 5 K	1	All
27	400400	. . Switch - Toggle, DPDT	2	All
28	405365-1	. . Switch - Toggle, SPST	2	All
29	405958-1	. . Receptacle - Box, 19 Pin	1	All
30	16DA-4107	. . Receptacle - 5 Pin, Amphenol	1	All
31	402670	. . Receptacle - Duplex	1	All
32	366826-1	. . Suppressor - Receptacle	1	All
33	402151	. . Holder - Fuse	1	All
34	W-10502-17	. . Fuse - Dual Element	1	All
35	401937-8	. . Block - Terminal	1	All
36	405072-1	. Diode - Light Emitting, Red	1	All
37	405734	. Bushing - Mtg. Led	1	All
—	402037-13	. Grommet - Rubber	1	All
—	402037-8	. Grommet - Rubber	1	All
—	Not Illustrated			

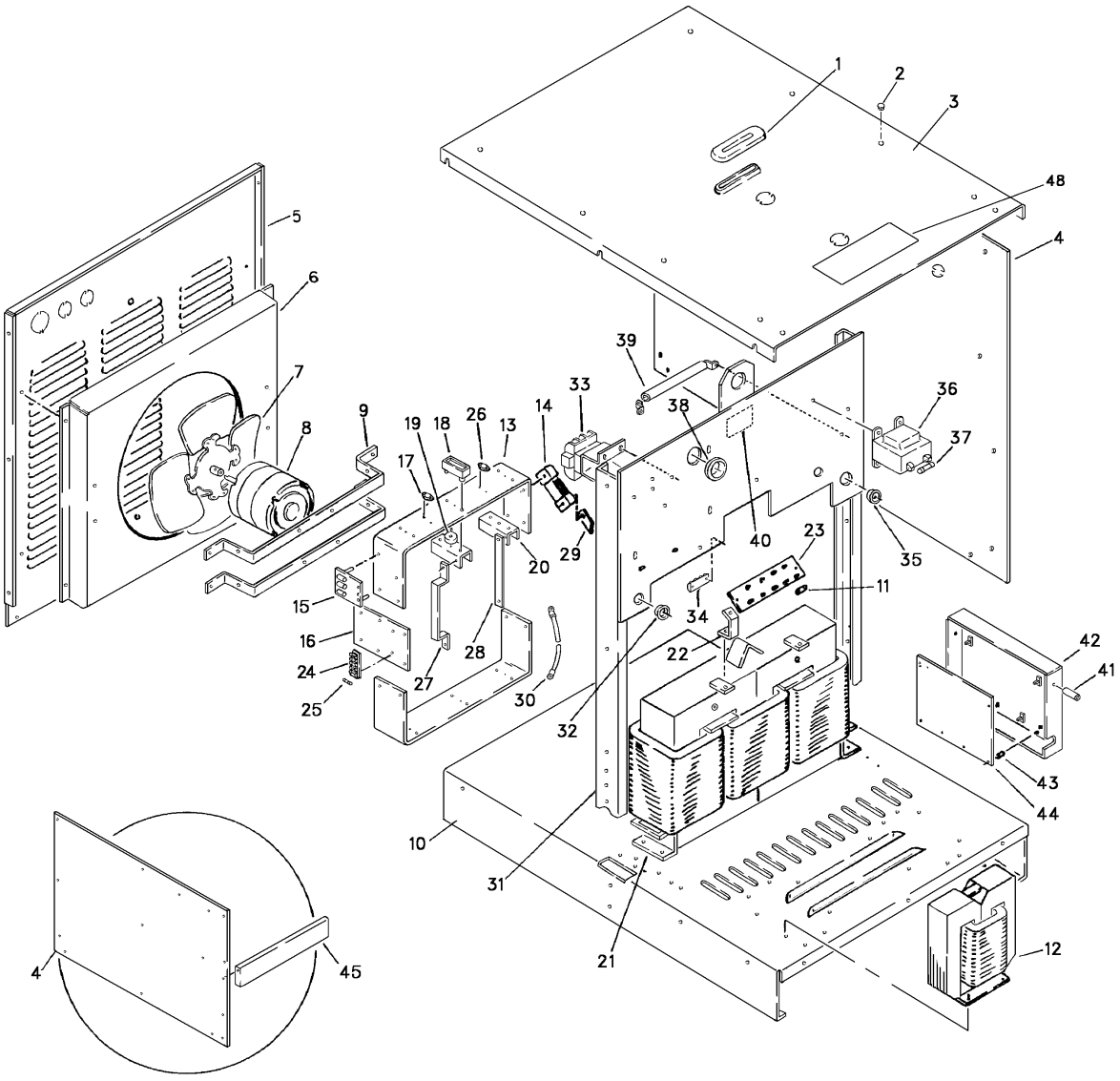


Figure 8-2 Base and Lifting Yoke Group

Parts List for Figure 8-2

Item No	Part Number	Description	Qty per Assy	Application Code
1	12CW-2170	Grommet - Top	1	All
2	403091-4	Plug - Hole, Plastic	8	All
3	369652	Panel - Top	1	ABCDE
	369652-1	Panel - Top	1	FG
4	369651	Panel - Side, Left & Right	2	ABCDE
	369651-1	Panel - Side, Left & Right	2	FG
5	369683	Panel - Rear	1	ABCDE
	369683-1	Panel - Rear	1	FG
6	369650	Shroud - Fan	1	ABCDE
	369650-1	Shroud - Fan	1	FG
7	8RT-609	Blade - Fan	1	All
8	12TW-595-1	Motor - Fan	1	All
9	369640	Bracket- Motor	2	ABCDE
	369640-1	Bracket- Motor	2	FG
10	369653	Base - Mounting	1	ABCDE
	369653-1	Base - Mounting	1	FG
11	CW-8ll	Link - Voltage Changeover	6	All
12	369778	Reactor - Filter	1	All
	369772-1	Rectifier - Output, Assembly	1	All
13	369774	. Heat Sink - Rect.	2	All
14	367687	. Shunt	1	All
15	367634A-6	. Suppressor - Surge, Assembly	2	All
16	369773	. Insulator - Mtg. Rect.	2	All
17	404044-7	. Thermostat - Overload	1	All
18	405140-1	. Clamp - Mtg.	6	All
19	405138	. Rectifier - Silicon	6	All
20	369642	. Heat Sink - SCR	6	All
—	16DA-954-12	.Pin- Spring	6	All
—	405157	. Label - Fuse	1	All
21	369805	Transformer - Assembly	1	A
	200026	Transformer - Assembly	1	BF
	200027	Transformer - Assembly	1	C
	200028	Transformer - Assembly	1	DG
	200029	Transformer - Assembly	1	E
22	367690	. Brace - V.C. Board	2	All
23	367170-5	. Board - V.C. Assembly	1	A
	367229-6	. Board - V.C. Assembly	1	BF
	367229-7	. Board - V.C. Assembly	1	C
	367229-9	. Board - V.C. Assembly	1	DG
—	Not Illustrated			

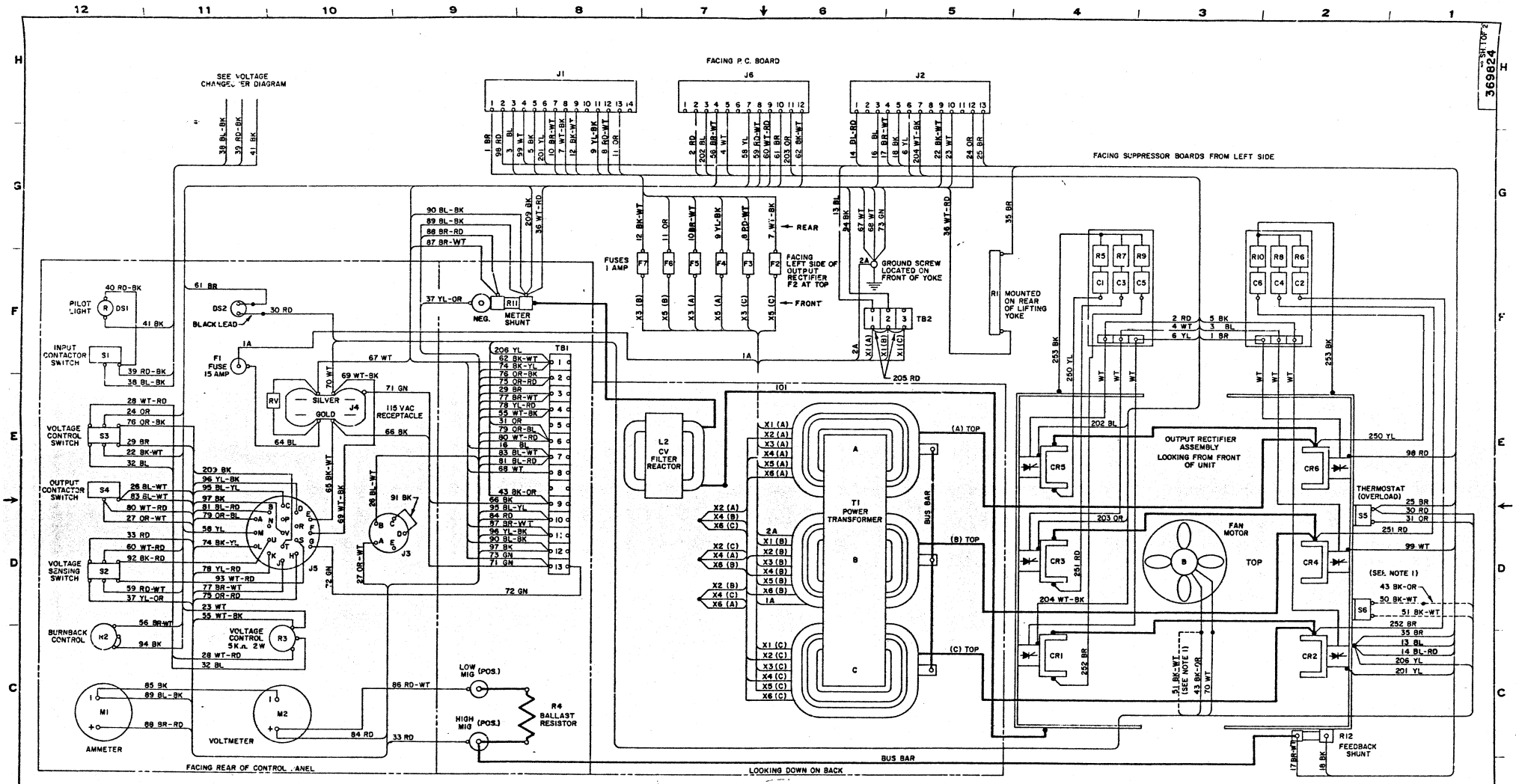
Parts List for Figure 8-2

Item No	Part Number	Description	Qty per Assy	Application Code
	367229-8	. Board - V.C. Assembly	1	E
24	405129-1	. Block - Fuse	1	All
25	W-11166-9	Fuse - 1 Amp AGC	6	All
26	200155A	Kit - Fan Turn On Thermostat (Optional)	Ref.	All
27	369816	Bus - Bar	1	All
28	369815	Bus - Bar	2	All
29	369703	Bus - Bar, Output	1	All
30	W-9350-221	Cable	1	All
	369629-5	Yoke - Lifting Assembly	1	AB
	369629-15	Yoke - Lifting Assembly	1	F
	369629-6	Yoke - Lifting, Assembly	1	CDE
	369629-16	Yoke - Lifting, Assembly	1	G
31	369631	. Yoke - Lifting	1	ABCDE
	369631-2	. Yoke - Lifting	1	FG
32	405362-1	. Bushing - Snap	2	All
33	405479	. Contactor	1	All
—	830116	.Label - Frame Ground	1	All
34	401937-9	. Strip - Terminal	1	All
35	402037-27	. Grommet - Rubber	1	All
36	406392-1	. Transformer - Control	1	ABF
	406392-2	. Transformer - Control	1	CDEG
37	W-11166-11	. Fuse - Control Transformer 5 Amp	1	All
—	406484	. Label - Fuse, Control Transformer	1	All
38	405362-2	. Bushing - Snap	1	All
39	406358-1	. Resistor - 25 Ohms, 175 Watts	1	All
40	408891	. Label - Warning	1	All
41	200114	Spacer	1	All
	369669-1	Panel - PC Board, Assembly	1	ABCDE
	369669-9	Panel - PC Board, Assembly	1	FG
42	369670	. Panel - PC Board	1	ABCDE
	369670-1	. Panel - PC Board	1	FG
43	404915-1	. Spacer - PC Board	6	All
44	369300	. Board - PC Assembly	1	All
	200157A	Kit - Terminal Cover (Optional)	Ref.	All
45	200280	. Cover - Terminal	1	All
46	. Deleted			
47	. Deleted			
48	204036	Label - Precautionary	1	All
—	Not Illustrated			

DIAGRAMS

- Note the model and specification number shown on the equipment nameplate.
- Locate these numbers in the model and specification number columns below.
- Use only those diagrams and instructions that are applicable.

MODEL NO.	SPEC NO.	CONNECTION AND SCHEMATIC DIAGRAM	VOLTAGE CHANGEOVER DIAGRAM	OUTLINE DIMENSION
MEGA-MIG	6310-1	369824	369705	369707
	6311-1 6311A-1	369824	200030	369707
	6312-1 6312A-1	369824	200031	369707
	6313-1	369824	200032	369707
	6314-1	369824	200033	369707



NOTES:

1. DASHED CIRCUITRY IS USED ONLY ON FAN THERMOSTAT. WIRE 43 BLK-ORN CONNECTS TO 57 BLK-WHT WHICH CONNECTS TO THERMOSTAT. WIRE 51 BLK-WHT CONNECTS TO FAN MOTOR AND THERMOSTAT.

COLOR CODE			
BK	BLACK	RD	RED
BR	BROWN	TN	TAN
BL	BLUE	VT	VIOLET(PURPLE)
GN	GREEN	WT	WHITE
GY	GRAY(SLATE)	YL	YELLOW
OR	ORANGE	D	DARK (PREFIX)
PK	PINK	L	LIGHT(PREFIX)

PROTECTIVE FINISH

CHANGE RECORD

No.	INDEX	DATE	No.	INDEX	DATE
1	X-0319	4-9-81	13		
2	XQ486	5-7-81	14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY	NO REQ	USED ON
SPECS	1	S-6310

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES MILLIMETERS TO LEARANCES BELOW MIN. EXCEPT FOR STOCK DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS DO NOT SCALE DRAWING

FRACTIONAL INCH | DECIMAL INCH .06 .01 .000 .005 | METRIC 0 - 1.0 mm 0.0 - .1 mm 0.00 - 0.1 mm

ANGLES ± | SURFACE TEXTURE

SCALE		ACCESS NO	
DRAWN	RAS	DATE	11-3-80
CHECKED	MIH	DATE	
ENGR APPD		DATE	
MFG APPD		DATE	
QUALITY		DATE	

TITLE: DIAGRAM, CONNECTION
NOW DATA: RC-300-RVS
DWG NO: 369756
SIZE: D
SHEET 1 OF 2

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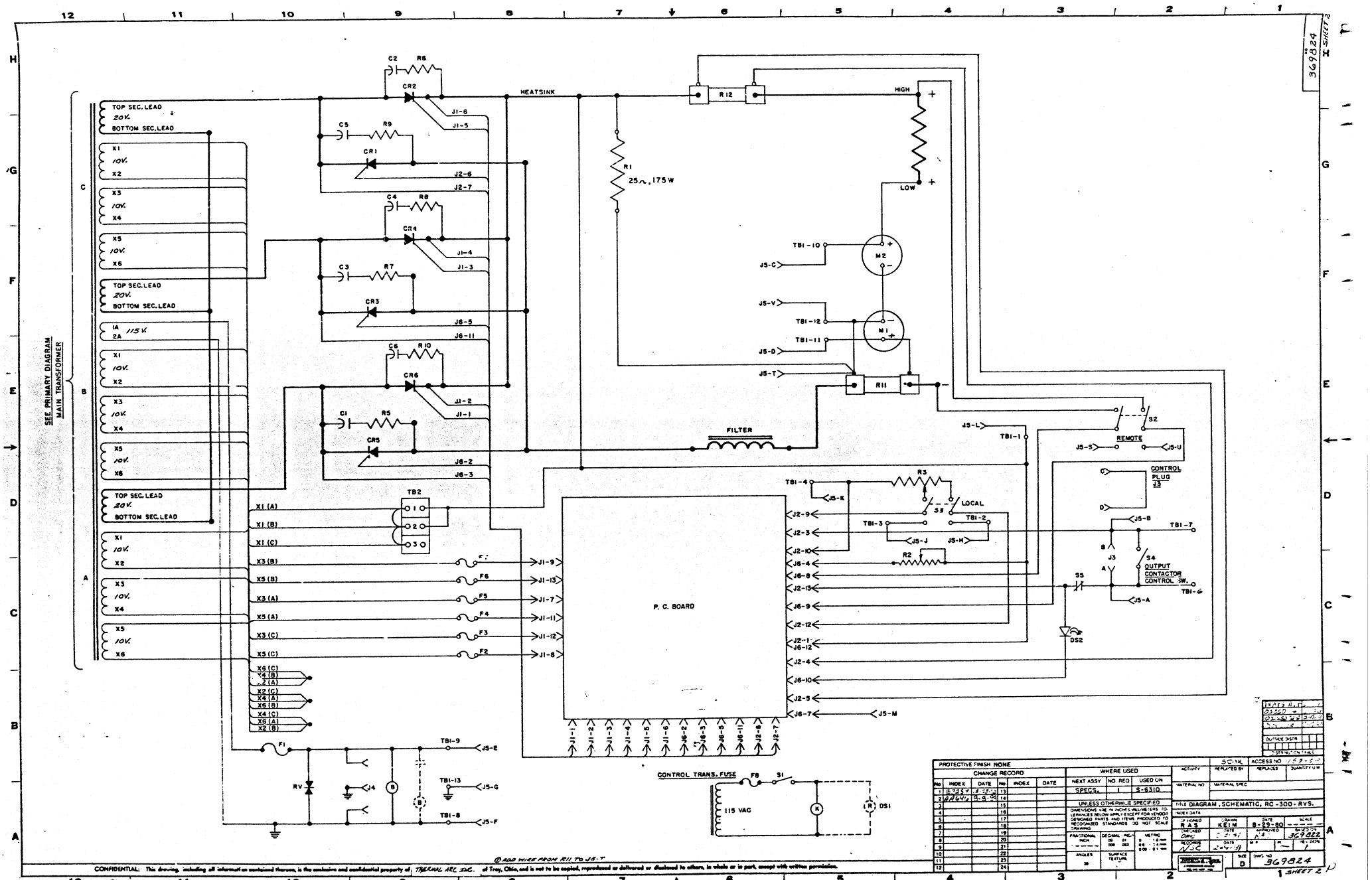
FORM NO. 434071



PROTECTIVE FINISH NONE

CHANGE RECORD

No	INDEX	DATE	No	INDEX	DATE
1	3795 V	8-29-80	13		
2	4046 V	9-9-80	14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY	NO REQ	USED ON
SPECS.	1	S-6310

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES MILLIMETERS TOLERANCES BELOW APPLY EXCEPT FOR STOCK DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS DO NOT SCALE DRAWING

FRACTIONAL INCH	DECIMAL INCH 00 .01 .005 .003	METRIC 0 1.0 mm .06 1.5 mm .010 .01 mm
ANGLES ±	SURFACE TEXTURE	

ACTIVITY: SCM
MATERIAL NO:
REPLACED BY:
REPLACES:
ACCESS NO:
QUANTITY U/M:
MATERIAL SPEC:
INDEX DATA:

DRAWN R A S	KEIM	DATE 8-29-80	SCALE
CHECKED	DATE	APPROVED	SIZE 369822
RECORDS	DATE	M F	PL

TITLE DIAGRAM, SCHEMATIC, RC-300-RVS.

SIZE D DWG NO 369824 SHEET 2

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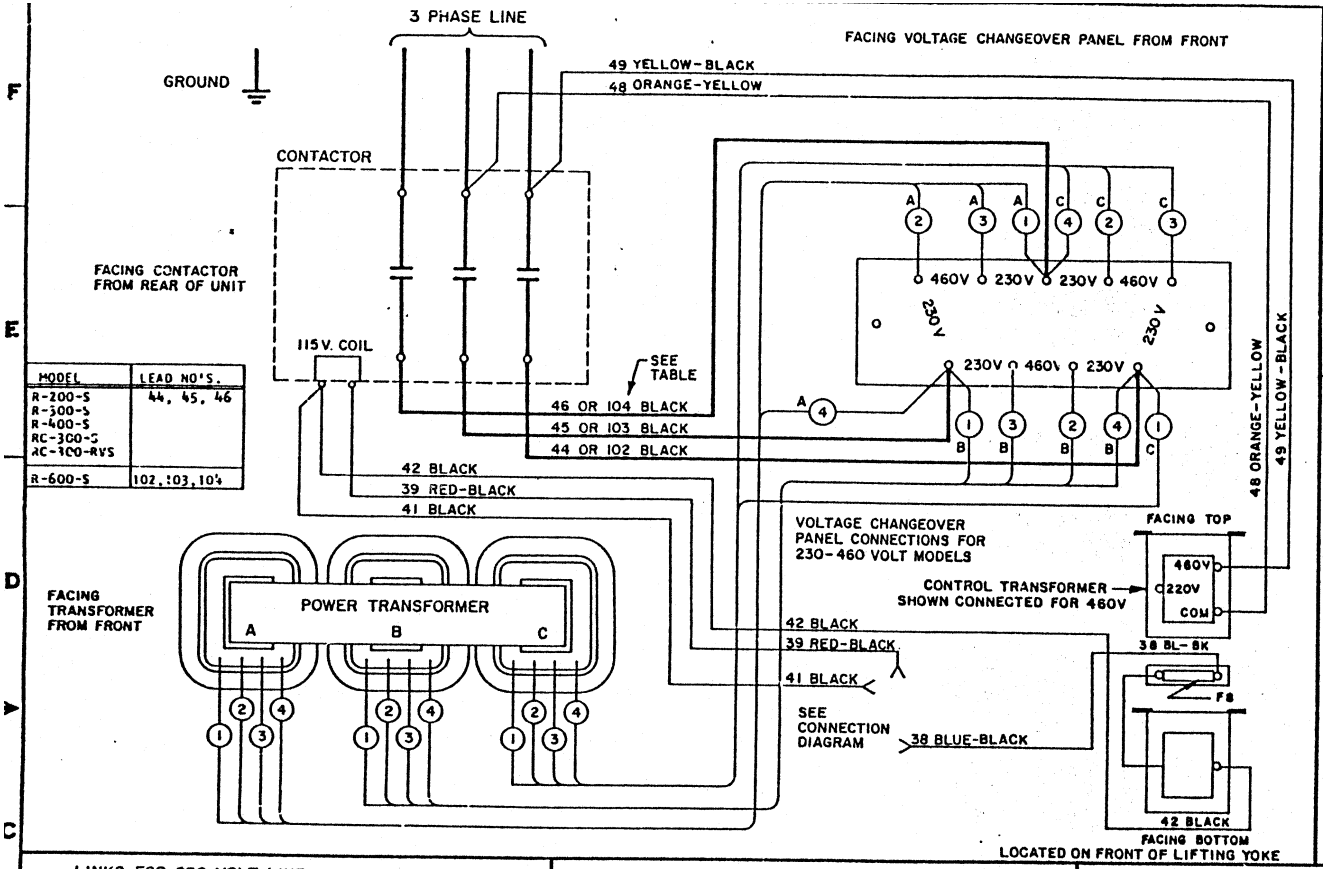
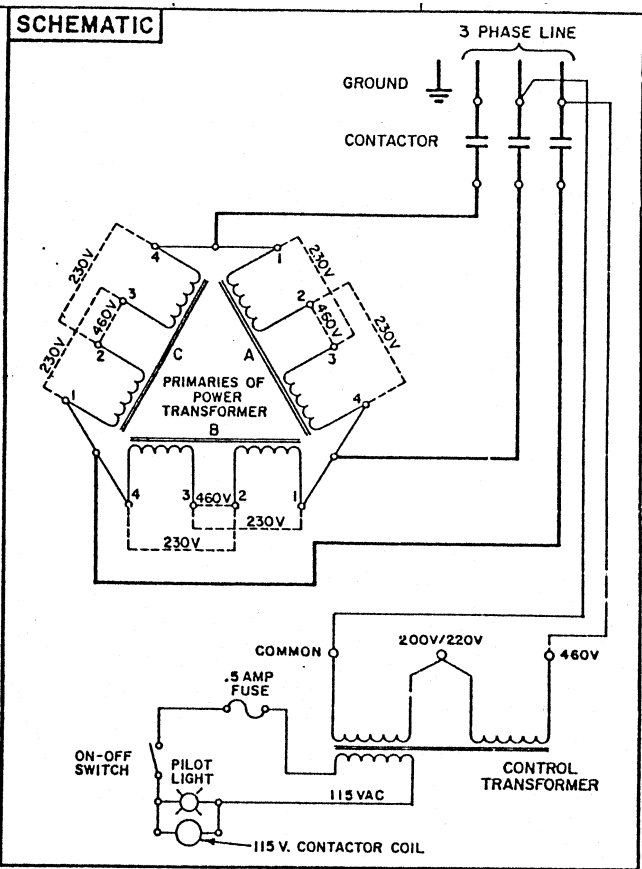
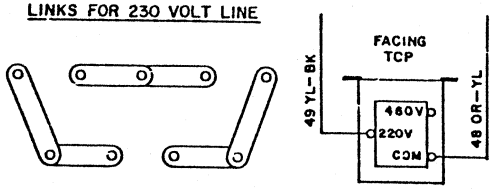


MODEL	LEAD NO'S.
R-200-S R-300-S R-400-S RC-300-S RC-300-RVS	44, 45, 46
R-600-S	102, 103, 104

SCHEMATIC



LINKS FOR 230 VOLT LINE

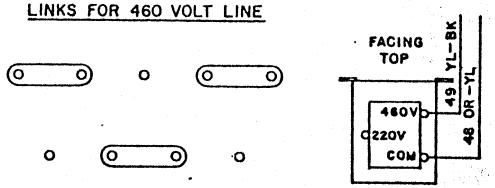


CONTROL TRANSFORMER CONNECTIONS

CONNECT 49 YL-BK TO TERMINAL MARKED 220V

FIG. 1

LINKS FOR 460 VOLT LINE



CONTROL TRANSFORMER CONNECTIONS

CONNECT 49 YL-BK TO TERMINAL MARKED 460V

FIG. 2

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL)

1. CHECK NAMEPLATE OF THE WELDER TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
2. CONNECT THE LINKS AS SHOWN IN FIG'S. 1 AND 2 AT LEFT, AS APPLICABLE, FOR THE PROPER LINE VOLTAGE.
3. CHECK YOUR LOCAL CODES FOR THE PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE OF THE WELDER. IF NO CODES EXISTS, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
4. CONNECT THE 3 PHASE POWER LINE TO THE TOP OF THE WELDER LINE CONTACTOR AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
5. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".

COLOR CODE

BK - BLACK	RD - RED		
BR - BROWN	TN - TAN		
BL - BLUE	VT - VIOLET		
GN - GREEN	WT - WHITE		
GY - GRAY(SLATE)	YL - YELLOW		
OR - ORANGE	D - DARK (PREFIX)		
PK - PINK	L - LIGHT (PREFIX)		

TAPE			
M.S.			
TUBING	7-87		
SCR.	4-24-7		
02-527	4-7-91		
OUTSIDE DISTR.			
DISTR. PER LIST ON TABLE			

PROTECTIVE FINISH

CHANGE RECORD

No.	INDEX	DATE	No.	INDEX	DATE
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY.	NO. REQ	USED ON
SPECS		

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES/MILLIMETERS TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DO NOT SCALE DRAWING

FRACTIONAL - INCH	DECIMAL - INCH	METRIC
±	.00 ± .01 .000 ± .003	0. ± 1.0 mm 0.0 ± 0.4 mm 0.00 ± 0.1 mm

ANGLES ± 1°

SURFACE TEXTURE

ACTIVITY	REPLACED BY	REPLACES	QUANTITY U/M
	M		ACCESS NO. 1180-06

MATERIAL NO. | MATERIAL SPEC

TITLE DIAGRAM, VOLTAGE CHANGEOVER

INDEX DATA R-200, 300, 400-S

DESIGNED	DRAWN	DATE	SCALE
WDB	MIH	8-26-80	
CHECKED	DATE	APPROVED	BASED ON
CF	6-17-91	WDB	
RECORDS	DATE	M.F.	REVISION
JVSC	6-17-91		0

SIZE C | DWG NO. 369705

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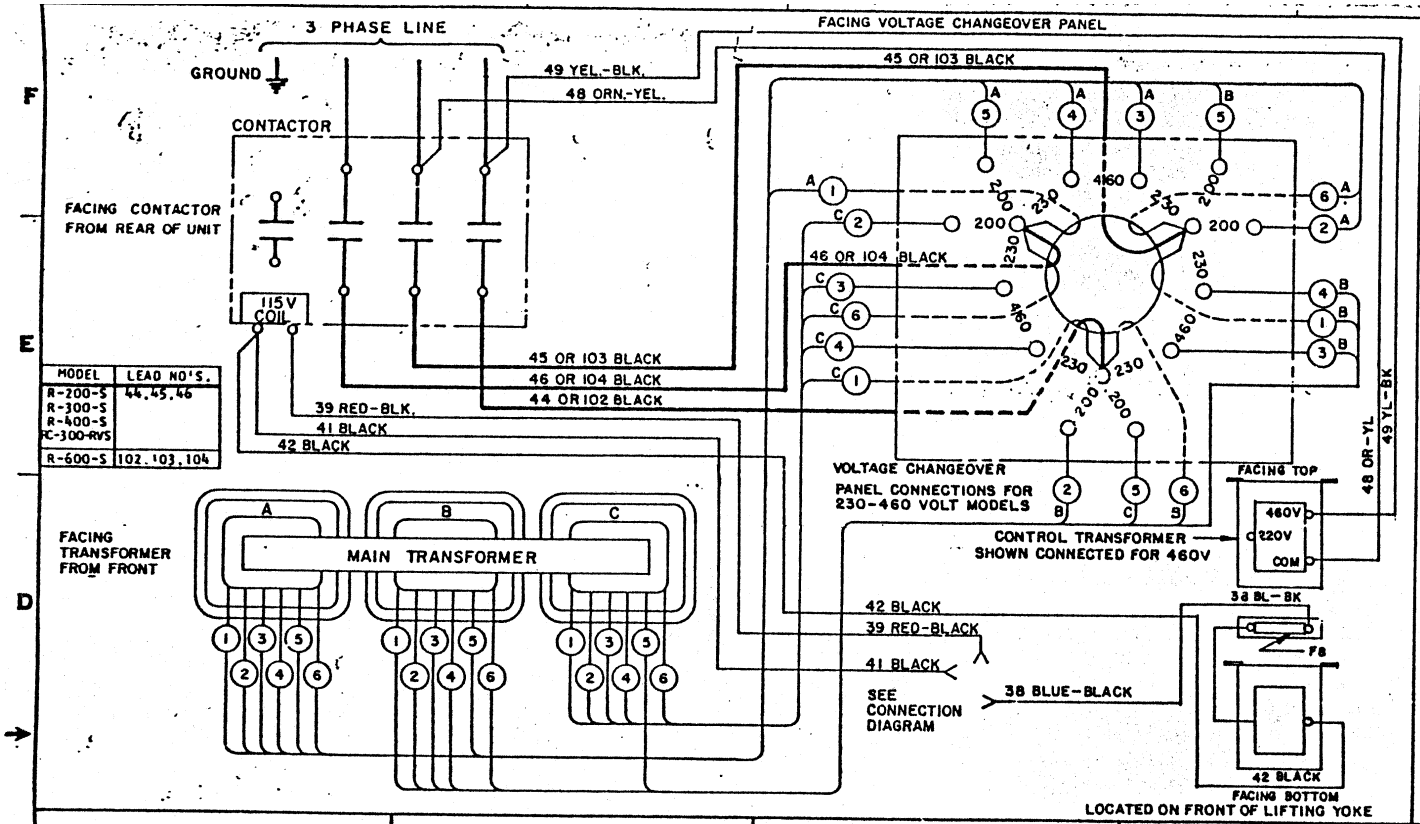
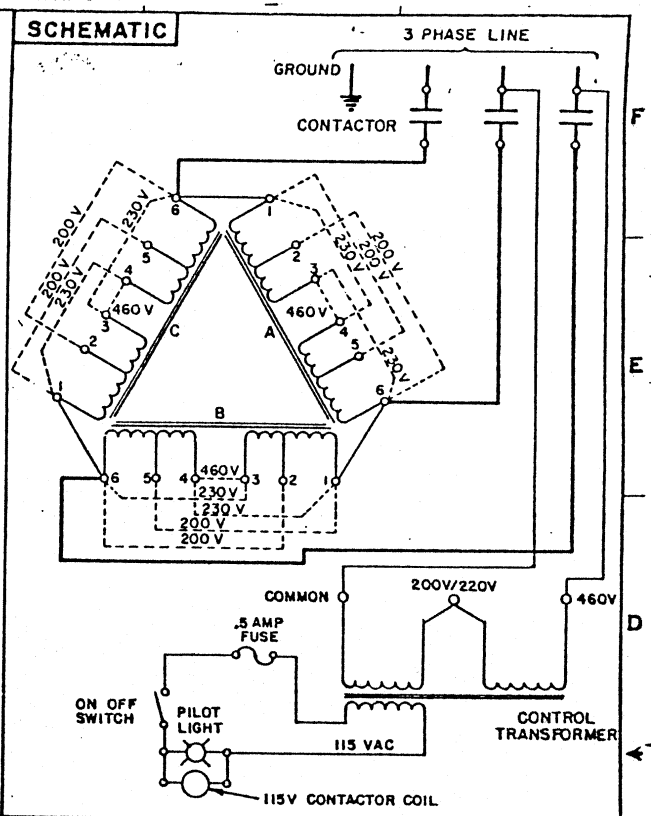
FORM NO. 424070





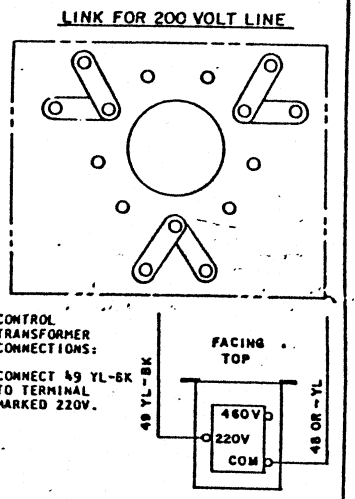


FIG. 1

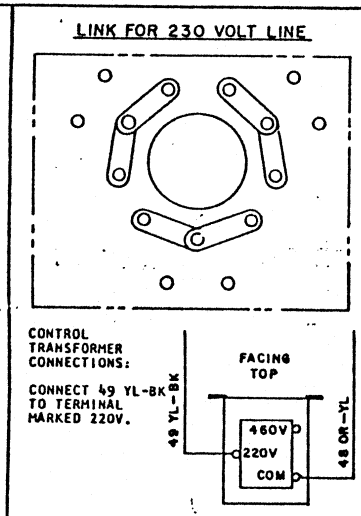


FIG. 2

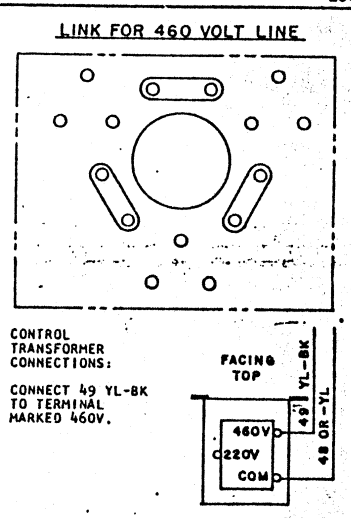


FIG. 3

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL)

1. CHECK NAMEPLATE OF THE WELDER TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
2. CONNECT THE LINKS AS SHOWN IN FIG'S. 1, 2, AND 3 AT LEFT, AS APPLICABLE, FOR THE PROPER LINE VOLTAGE.
3. CHECK YOUR LOCAL CODES FOR THE PROPER LINE WIPE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE OF THE WELDER. IF NO CODES EXISTS, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
4. CONNECT THE 3 PHASE POWER LINE TO THE TOP OF THE WELDER LINE CONTACTOR AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
5. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".

COLOR CODE

BK - BLACK	RD - RED
BR - BROWN	TN - TAN
BL - BLUE	VT - VIOLET
GN - GREEN	WT - WHITE
GY - GRAY(SLATE)	YL - YELLOW
OR - ORANGE	D - DARK(PREFIX)
PK - PINK	L - LIGHT(PREFIX)

(2 SHEETS)

RECOMPILED

R.A.S.	1-11-81
TRACED BY	
CHECKED BY	5-22
APPROVED BY	2-27-81
02-527	97-21
OUTSIDE DISTR.	
DISTRIBUTION TABLE	

PROTECTIVE FINISH NONE.

CHANGE RECORD

No.	INDEX	DATE	No.	INDEX	DATE
1	X0636	6-22-81	13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY.	NO. REQ.	USED ON
SPECS		S-6311

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES. DO NOT SCALE DRAWING. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.
SURFACE TEXTURE
FRACTIONS ± | DECIMALS .00 ± .01, .000 ± .003 | ANGLES ± 30'

ACTIVITY	SD/R	ACCESS NO. 1180-06	
	REPLACED BY	REPLACES	QUANTITY A.M.
MATERIAL NO.	MATERIAL SPEC.		

TITLE DIAGRAM, VOLTAGE CHANGEOVER
INDEX DATA RC-300-RVS

DESIGNED	DRAWN	DATE	SCALE
RAS	MIH	2-4-81	
CHECKED	DATE	APPROVED	PREPD FROM
OFC	2-23-81	RAS	368316
RECORDS	DATE	INDEXED	M.P.
NSC	2-25-91		

SIZE C | DWG. NO. 200030

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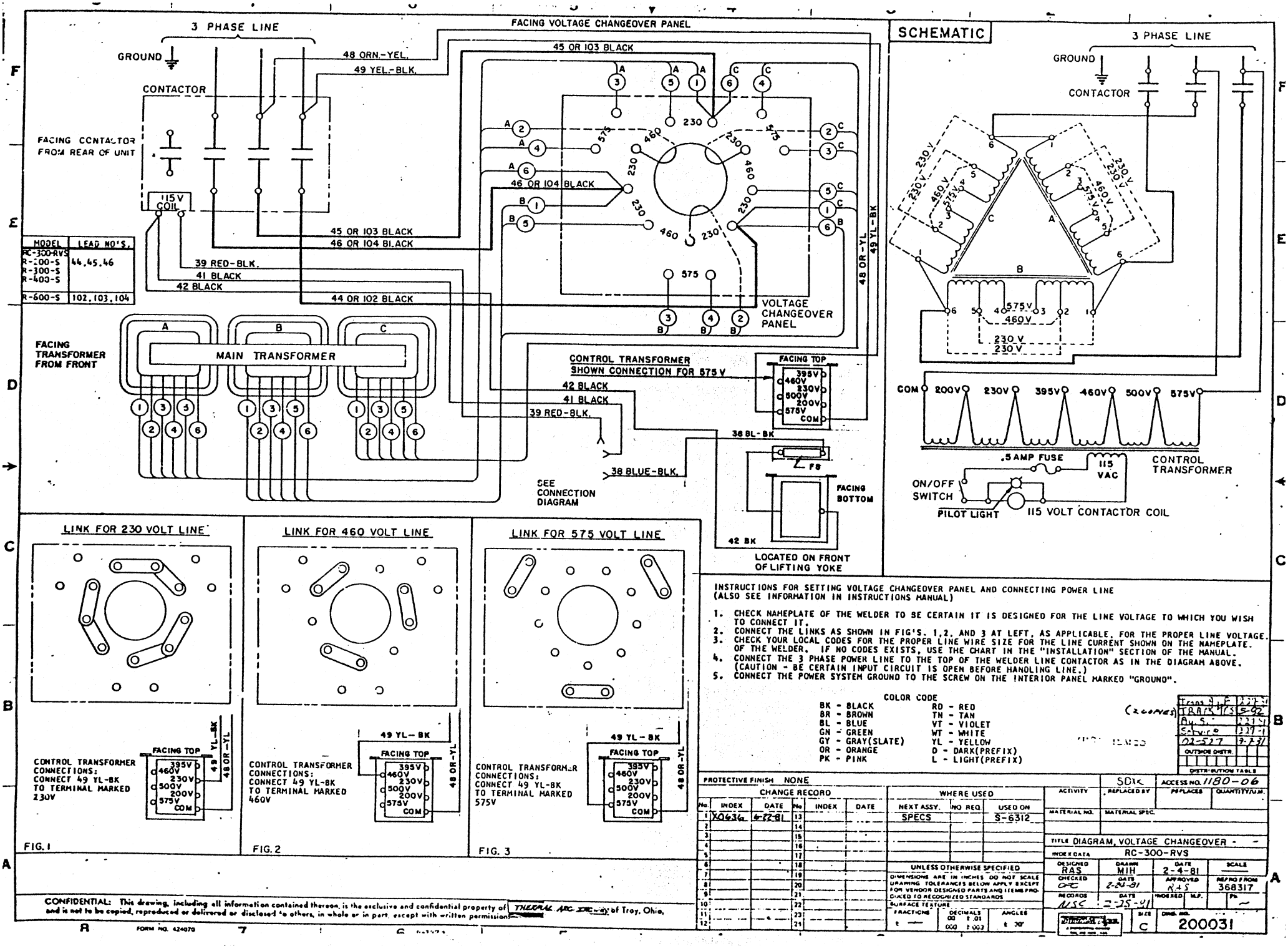
FORM NO. 434070



MODEL	LEAD NO'S.
RC-300-RVS R-200-S R-300-S R-400-S	44,45,46
R-600-S	102,103,104

LINK FOR 230 VOLT LINE

CONTROL TRANSFORMER CONNECTIONS: CONNECT 49 YL-BK TO TERMINAL MARKED 230V

FIG. 1

LINK FOR 460 VOLT LINE

CONTROL TRANSFORMER CONNECTIONS: CONNECT 49 YL-BK TO TERMINAL MARKED 460V

FIG. 2

LINK FOR 575 VOLT LINE

CONTROL TRANSFORMER CONNECTIONS: CONNECT 49 YL-BK TO TERMINAL MARKED 575V

FIG. 3

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTIONS MANUAL)

1. CHECK NAMEPLATE OF THE WELDER TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
2. CONNECT THE LINKS AS SHOWN IN FIG'S. 1,2, AND 3 AT LEFT, AS APPLICABLE, FOR THE PROPER LINE VOLTAGE.
3. CHECK YOUR LOCAL CODES FOR THE PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE. OF THE WELDER. IF NO CODES EXISTS, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
4. CONNECT THE 3 PHASE POWER LINE TO THE TOP OF THE WELDER LINE CONTACTOR AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
5. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".

COLOR CODE

BK - BLACK	RD - RED
BR - BROWN	TN - TAN
BL - BLUE	VT - VIOLET
GN - GREEN	WT - WHITE
GY - GRAY(SLATE)	YL - YELLOW
OR - ORANGE	D - DARK(PREFIX)
PK - PINK	L - LIGHT(PREFIX)

(2 COPIES)

Trans N.F.	2-27-81	
TRACK 1/S	5-82	B
Ay S.	2-27-81	
S-Svc.	3-27-81	
02-527	9-2-81	
OUTSIDE DISTR.		

DISTRIBUTION TABLE

PROTECTIVE FINISH NONE

CHANGE RECORD

No.	INDEX	DATE	No.	INDEX	DATE
1	X0436	4-22-81	13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY.	NO REQ.	USED ON
SPECS		S-6312

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES DO NOT SCALE
DRAWING TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS
SURFACE TEXTURE
FRACTIONS ± —
DECIMALS .00 ± .01 .000 ± .003
ANGLES ± 30'

ACTIVITY	REPLACED BY	REPLACES	QUANTITY/UM
MATERIAL NO.	MATERIAL SPEC.		

ACCESS NO. 1180-06

TITLE DIAGRAM, VOLTAGE CHANGEOVER - -
INDEX DATA RC-300-RVS

DESIGNED	DRAWN	DATE	SCALE
RAS	MIH	2-4-81	
CHECKED	DATE	APPROVED	REPRO FROM
DC	2-20-81	R+S	368317
RECORDS	DATE	INDEXED	M.P.
MSC	2-25-81		

SIZE C DWG. NO. 200031

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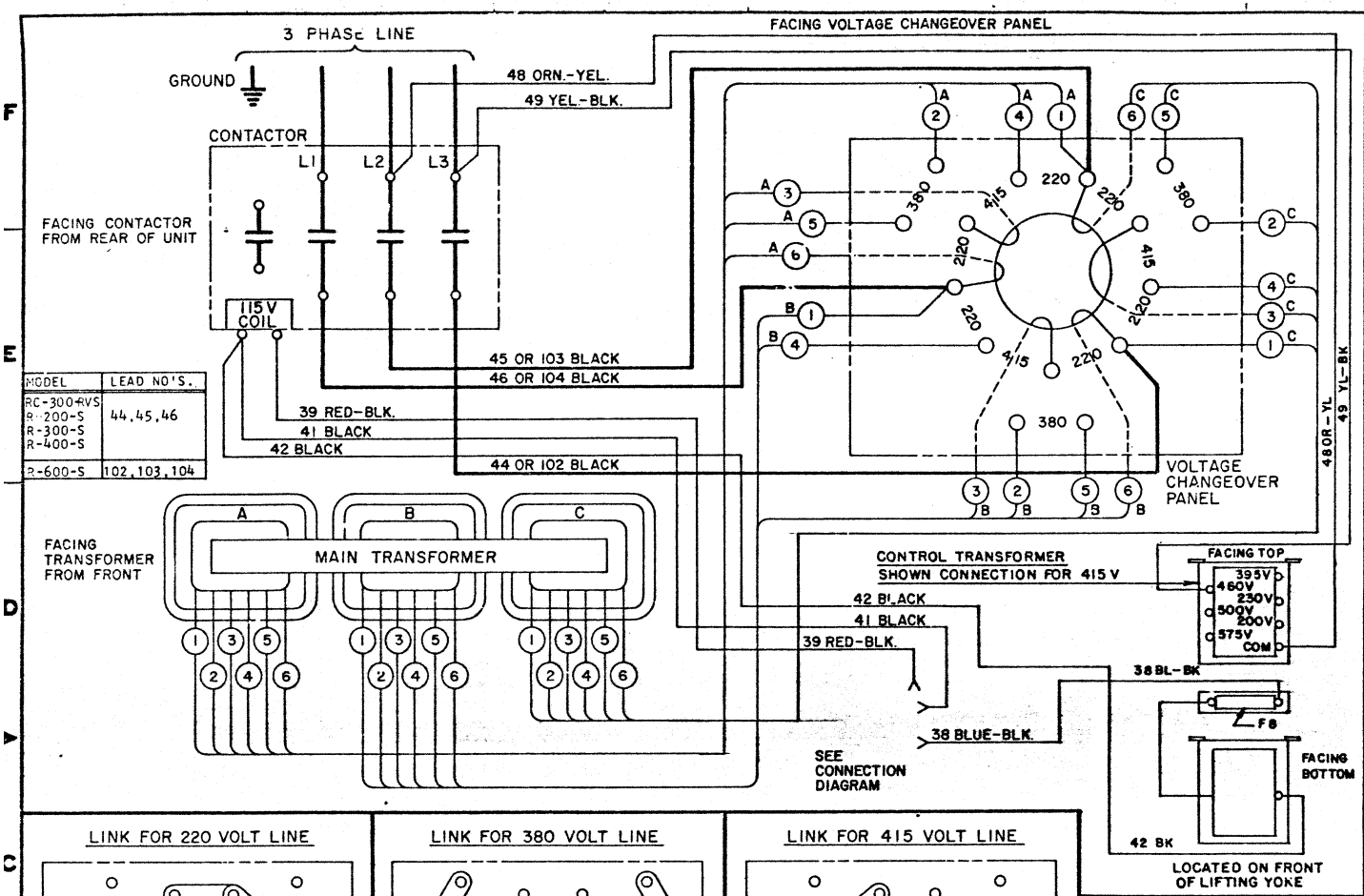
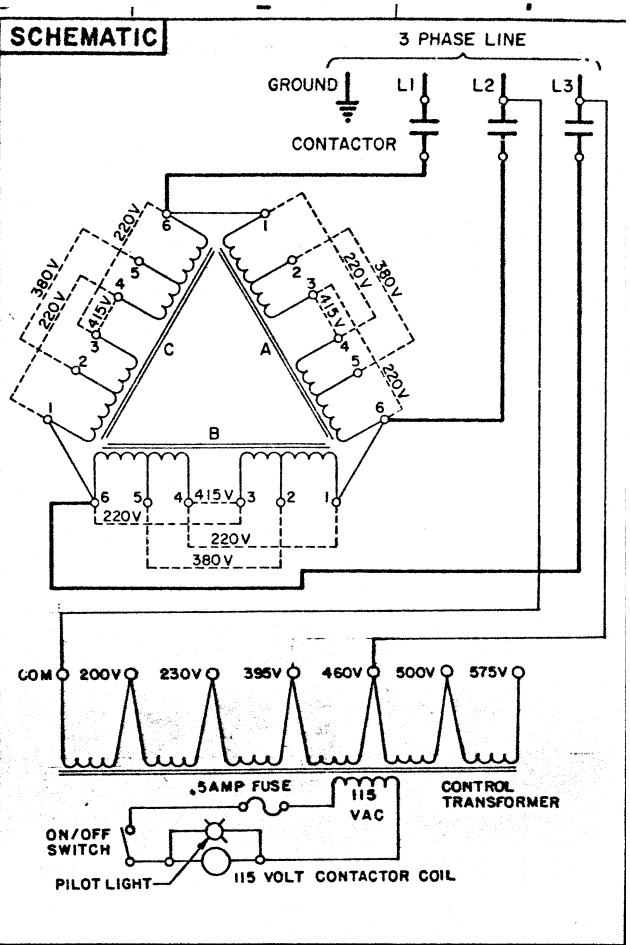
FORM NO. 424070

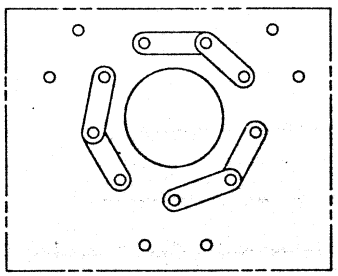


MODEL	LEAD NO'S.
RC-300-RVS R-200-S R-300-S R-400-S	44,45,46
R-600-S	102,103,104

SCHEMATIC



LINK FOR 220 VOLT LINE



CONTROL TRANSFORMER CONNECTION: CONNECT 49 YL-BK TO TERMINAL MARKED 230 VOLTS.

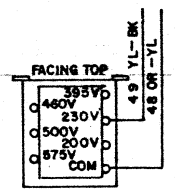
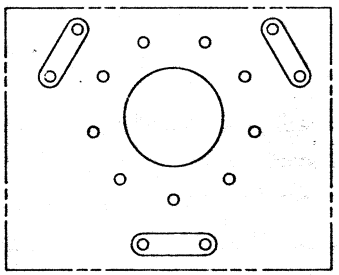


FIG. 1

LINK FOR 380 VOLT LINE



CONTROL TRANSFORMER CONNECTIONS: CONNECT 49 YL-BK TO TERMINAL MARKED 395 VOLTS

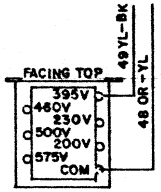
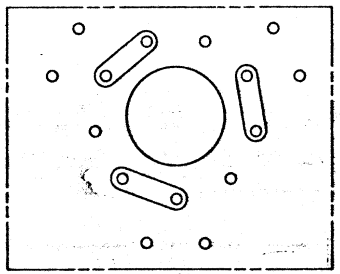


FIG. 2

LINK FOR 415 VOLT LINE



CONTROL TRANSFORMER CONNECTIONS: CONNECT 49 YL-BK TO TERMINAL MARKED *460* VOLTS

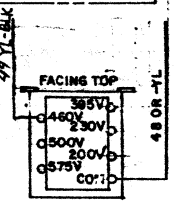


FIG. 3

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL).

1. CHECK NAMEPLATE OF THE WELDER TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
2. CONNECT THE LINKS AS SHOWN IN FIG'S. 1,2, AND 3 AT LEFT, AS APPLICABLE, FOR THE PROPER LINE VOLTAGE.
3. CHECK YOUR LOCAL CODES FOR THE PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE OF THE WELDER. IF NO CODES EXISTS, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
4. CONNECT THE 3 PHASE POWER LINE TO THE TOP OF THE WELDER LINE CONTACTOR AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
5. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".

COLOR CODE.

BK - BLACK	RD - RED
BR - BROWN	TN - TAN
BL - BLUE	VT - VIOLET(PURPLE)
GN - GREEN	WT - WHITE
GY - GRAY(SLATE)	YL - YELLOW
OR - ORANGE	D - DARK(PREFIX)
PK - PINK	L - LIGHT(PREFIX)

(2 COPIES) MICOFILMED

RAS	2-27-81	
TRANS A	2-27-81	
TRANS. TAPS	2-27-81	
Service	2-27-81	
OUTSIDE DISTR		
DISTRIBUTION TABLE		

PROTECTIVE FINISH

CHANGE RECORD

No.	INDEX	DATE	No.	INDEX	DATE
1	X0636	6-22-81	13		
A	2150	5-19-78	14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY.	NO REQ.	USED ON
SPECS	1	S-6313

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES MILLIMETERS TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS DO NOT SCALE DRAWING

FRACTIONAL INCH ± 1/64 | DECIMAL - INCH .00 ± .01, .000 ± .005 | METRIC 0 ± 1.0 mm, 0.0 ± 0.4 mm, 0.00 ± 0.1 mm
ANGLES ± 30 | SURFACE TEXTURE

ACTIVITY	REPLACED BY	REPLACES	QUANTITY U/M
SDXR	ADDESS NO 1180-06		
MATERIAL NO	MATERIAL SPEC		

TITLE DIAGRAM, VOLTAGE CHANGEOVER
INDEX DATA RC-300-RVS

DESIGNED	DRAWN	DATE	SCALE
RAS	MIH	2-5-81	
CHECKED	DATE	APPROVED	BASED ON
OFC	2-24-81	RAS	369374
RECORDS	DATE	M F	PI — REVISION
NSC	2-25-81		

SIZE C DWG NO 200032

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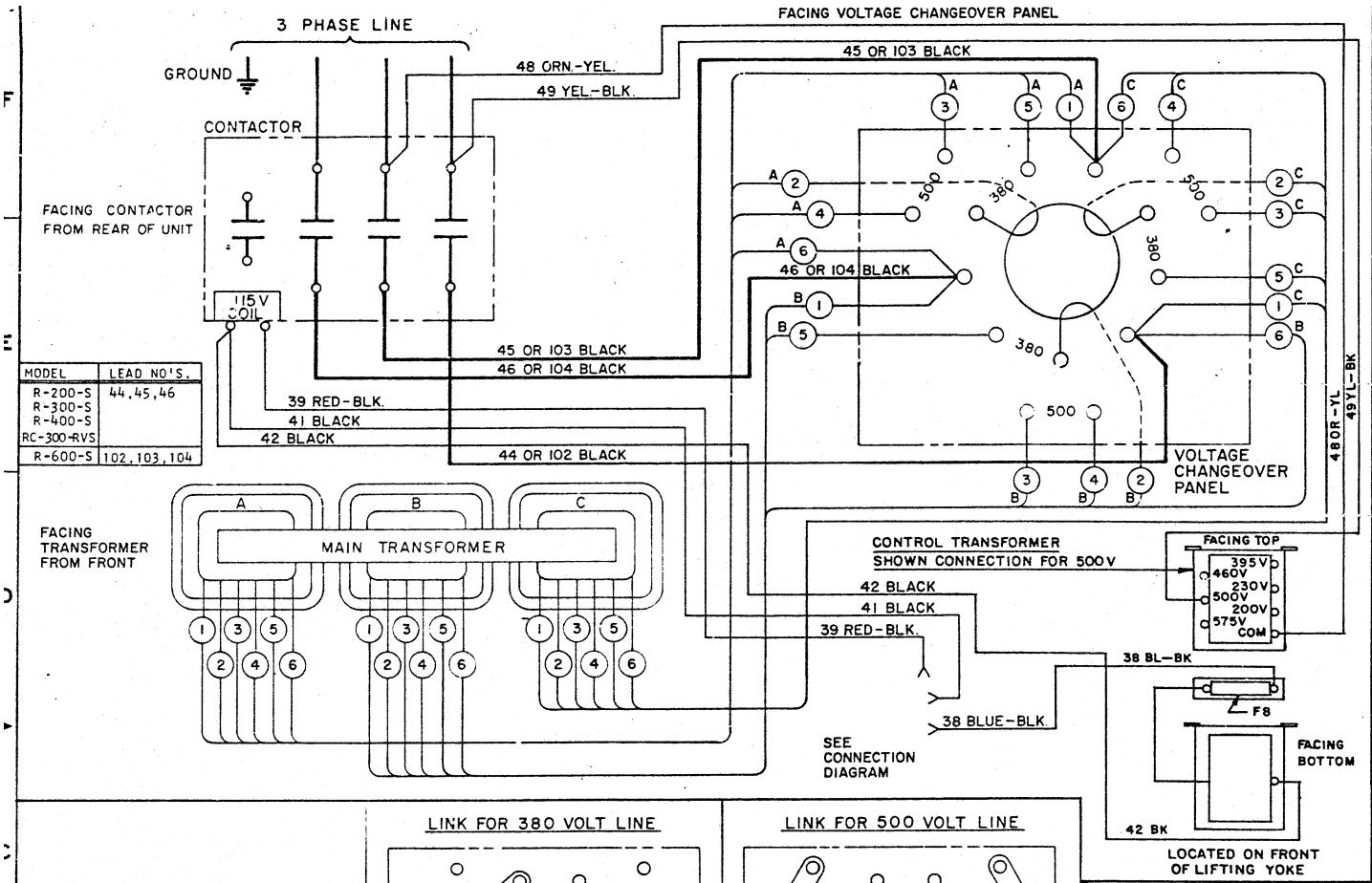
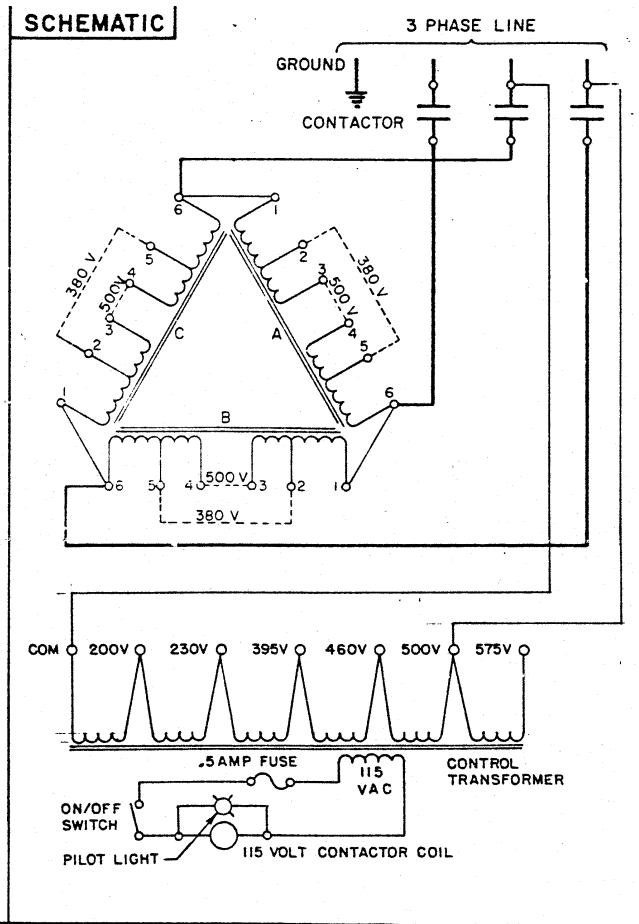
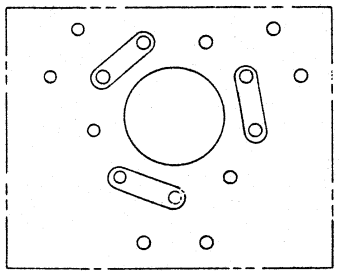


MODEL	LEAD NO'S.
R-200-S R-300-S R-400-S RC-300-RVS	44,45,46
R-600-S	102,103,104

SCHEMATIC



LINK FOR 380 VOLT LINE



CONTROL TRANSFORMER CONNECTIONS
CONNECT 49 YL-BK TO TERMINAL MARKED 395 VOLTS

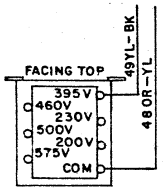
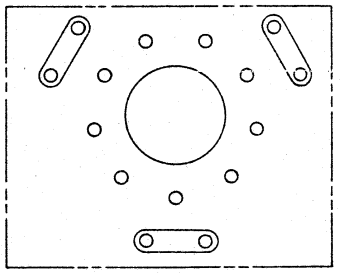


FIG. 1

LINK FOR 500 VOLT LINE



CONTROL TRANSFORMER CONNECTIONS
CONNECT 49 YL-BK TO TERMINAL MARKED 500 VOLTS

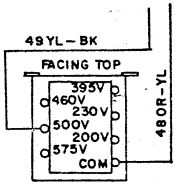


FIG. 2

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL).

1. CHECK NAMEPLATE OF THE WELDER TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
2. CONNECT THE LINKS AS SHOWN IN FIG'S. 1 AND 2 AT LEFT, AS APPLICABLE, FOR THE PROPER LINE VOLTAGE.
3. CHECK YOUR LOCAL CODES FOR THE PROPER LINE WIRE SIZE FOR THE CURRENT SHOWN ON THE NAMEPLATE OF THE WELDER. IF NO CODES EXISTS, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
4. CONNECT THE 3 PHASE POWER LINE TO THE TOP OF THE WELDER LINE CONTACTOR AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
5. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".

COLOR CODE

BK - BLACK	RD - RED
BR - BROWN	TN - TAN
BL - BLUE	VT - VIOLET(PURPLE)
GN - GREEN	WT - WHITE
GY - GRAY(SLATE)	YL - YELLOW
OR - ORANGE	D - DARK(PREFIX)
PK - PINK	L - LIGHT(PREFIX)

(2 COPIES) MICROFILMED

A.S.	2-27-81	
TRANS. DEPT.	3-3-81	
TRANSTAR	5-8-81	
SERVICE	2-27-81	
02-527	9-9-81	
OUTSIDE DISTR.		
DISTRIBUTION TABLE		

PROTECTIVE FINISH NONE

SD/R

ACCESS NO. 1180-06

CHANGE RECORD

No.	INDEX	DATE	No.	INDEX	DATE
1	XO636	6-22-81	13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

MATERIAL USED			ACTIVITY	REPLACED BY	REPLACES	QUANTITY/U.M.
	REQ'D	USED ON				
SPECS	/	S-6314	MATERIAL NO.	MATERIAL SPEC.		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.
SURFACE TEXTURE

FRACTIONS	DECIMALS	ANGLES
± —/—	.00 ± .01 .000 ± .003	± 30'

TITLE DIAGRAM, VOLTAGE CHANGEOVER

INDEX DATA RC-300-RVS

DESIGNED	DRAWN	DATE	SCALE
RAS	MIH	2-5-81	
CHECKED	DATE	APPROVED	REPRO FROM
OFC	2-24-81	RAS	368318
RECORDS	DATE	INDEXED	M.F.
JUSC	2-25-81		

SIZE C

DWG. NO. 200033

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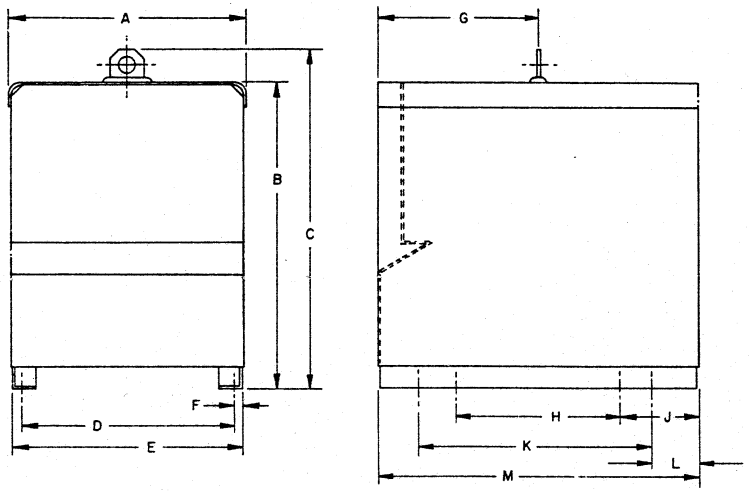

	DRAWING NUMBER	WHERE USED	DIMENSIONS IN	DIMENSION											
				A	B	C	D	E	F	G	H	J	K	L	M
③	369707-1	RC-300-RVS, RC-450-RVS, RCC-450-RVS, R-200-S, R-300-S, R-400-S RC-650-SSP	ENGLISH INCHES	21-1/2	26-1/2	29-1/2	19-3/4	21-3/8	13/16	14-9/16	14-3/4	7-3/16	20-3/4	4-3/16	29-1/8
			METRIC MILLIMETERS	546	673.1	749.3	501.6	542.9	20.6	369.9	374.6	182.6	527	106.4	737.8
①	369707-2	RC-650-RVS, RCC-650-RVS, R-600-S	ENGLISH INCHES	24-1/4	26-1/2	29-1/2	22-1/2	24	3/4	16-3/16	19-3/4	7-3/16	25-3/4	4-3/16	34-1/8
			METRIC MILLIMETERS	616.0	673.1	749.3	571.5	609.6	19.1	411.2	501.7	182.6	654.1	106.4	866.8
②	369707-3	TR-300-HF	ENGLISH INCHES	24-1/4	26-1/2	29-1/2	22-1/2	24	3/4	18-11/16	19-3/4	7-3/16	25-3/4	4-3/16	39-1/8
			METRIC MILLIMETERS	616.0	673.1	749.3	571.5	609.6	19.1	474.7	501.7	182.6	654.1	106.4	993.8

OUTSIDE DISTR.

DISTRIBUTION TABLE

PROTECTIVE FINISH NONE

CHANGE RECORD

No.	INDEX	DATE	No.	INDEX	DATE
1	RAS	5-27-82	13		
2	RAS	6-1-82	14		
3	RAS	5-8-83	15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY.	NO. REQ.	USED ON
		SEE CHART

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES. DO NOT SCALE DRAWING. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.

SURFACE TEXTURE

FRACTIONS	DECIMALS	ANGLES
± ----	.00 ± .01 .000 ± .003	± 30'

ACTIVITY	REPLACED BY	ACCESS NO.	
		REPLACES	QUANTITY/U.M.
MATERIAL NO.	MATERIAL SPEC.		

TITLE OUTLINE, DIMENSIONAL

INDEX DATA

DESIGNED WDB	DRAWN KEM 7-14-81	DATE	SCALE NONE
CHECKED SEC	DATE 7-16-81	APPROVED	REPRO FROM 367182
RECORDS PSD	DATE 7-17-81	INDEXED / M.F. / PL / REVISION	

THERMAL ARC

SIZE C

DWG. NO. 369707

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LIMITED WARRANTY: Thermal Arc®, Inc., A Thermadyne Company, warrants that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the Thermal Arc products as stated below, Thermal Arc shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with Thermal Arc's specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at Thermal Arc's sole option, of any components or parts of the product determined by Thermal Arc to be defective.

THERMAL ARC MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: Thermal Arc shall not under any circumstances be liable for special or consequential damages, such as, but not limited to, damage or loss of purchased or replacement goods, or claims of customers of distributor (hereinafter "Purchaser") for service interruption. The remedies of the Purchaser set forth herein are exclusive and the liability of Thermal Arc with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by Thermal Arc whether arising out of contract, negligence, strike tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based. No employee, agent, or representative of Thermal Arc is authorized to change this warranty in any way or grant any other warranty.

PURCHASER'S RIGHTS UNDER THIS WARRANTY ARE VOID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH IN THERMAL ARC'S SOLE JUDGMENT MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY THERMAL ARC PRODUCT.

PURCHASER'S RIGHTS UNDER THIS WARRANTY ARE VOID IF THE PRODUCT IS SOLD TO PURCHASER BY NON-AUTHORIZED PERSONS.

Except with regards to the products listed below, this warranty shall remain effective three (3) years from the date Thermal Arc's authorized distributor delivers the product to Purchaser, but in no event more than (4) years from the date Thermal Arc delivers the product to the authorized distributor.

Shorter warranty periods apply to the products listed below. On these products, the warranty is effective for the time stated below beginning on the date that the authorized distributor delivers the products to the Purchaser. Notwithstanding the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date Thermal Arc delivered the product to the authorized distributor.

	ALL OTHER	**P-WEE, PRO-LITE**	
POWER SUPPLIES	POWER SUPPLIES	PRO-PLUS, PRO-WAVE	LABOR
MAIN POWER MAGNETICS (STATIC & ROTATING)	3 YEARS	2 YEARS	1 YEAR
ORIGINAL MAIN POWER RECTIFIER	3 YEARS	2 YEARS	1 YEAR
CONTROL PC BOARD	3 YEARS	2 YEARS	1 YEAR
ALL OTHER CIRCUITS AND COMPONENTS INCLUDING BUT NOT LIMITED TO, CONTACTORS, RELAYS, SOLENOID, PUMPS, POWER SWITCHING SEMI-CONDUCTORS	1 YEAR	1 YEAR	1 YEAR
ENGINES: ENGINES ARE NOT WARRANTED BY THERMAL ARC, ALTHOUGH MOST ARE WARRANTED BY THE ENGINE MANUFACTURER. SEE THE ENGINE MANUFACTURES WARRANTY FOR DETAILS.			
CONSOLES, CONTROL EQUIPMENT, HEAT EXCHANGES, AND ACCESSORY EQUIPMENT	1 YEAR	1 YEAR	1 YEAR
TORCH AND LEADS	180 DAYS	180 DAYS	180 DAYS
REPAIR/REPLACEMENT PARTS	90 DAYS	90 DAYS	90 DAYS

Warranty repairs or replacement claims under this limited warranty must be submitted to Thermal Arc by an authorized Thermal Arc® repair facility within thirty (30) days of the repair. No transportation costs of any kind will be paid under this warranty. Transportation charges to send products to an authorized warranty repair facility shall be the responsibility of the customer. All returned goods shall be at the customer's risk and expense. This warranty supersedes all previous Thermal Arc warranties.

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